FEBRUARY, 1962 • 35¢

AMERICAN Cinematographer

Magazine Of Motion Picture Photography And Production Techniques

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WHAT'S NEW IN EQUIPMENT, ACCESSORIES, SERVICES • HOLLYWOOD
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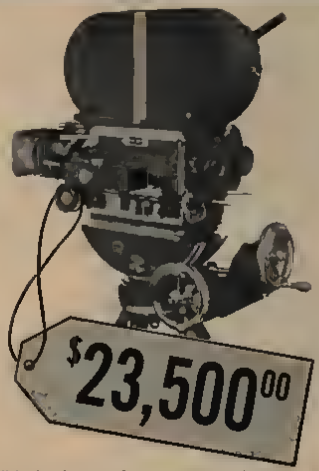

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MARION HUTCHINS, Editorial Assistant

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Editorial and Business Offices: 1782 North Orange Drive, Hollywood 28, Calif. Telephone. HOllywood 7-2135

February, 1962 **Vol. 43, No. 2**

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AMERICAN CINEMATOGRAPHER, established 1920, is published monthly by the A. S. C. Agency, Inc. 1782 N. Orange Dr., Hollywood 28 Calif. SUBSCRIPTIONS: United States and Canada, $4.00 per year, Foreign, including Pan-American Union, $5.00 per year. Single copies 35 cents, back numbers 45 cents, foreign single copies, 45 cents, back numbers, 55 cents. Advertising rates on application. Copyright 1962 by A. S. C. Agency, Inc. Second-class postage paid at Los Angeles, California

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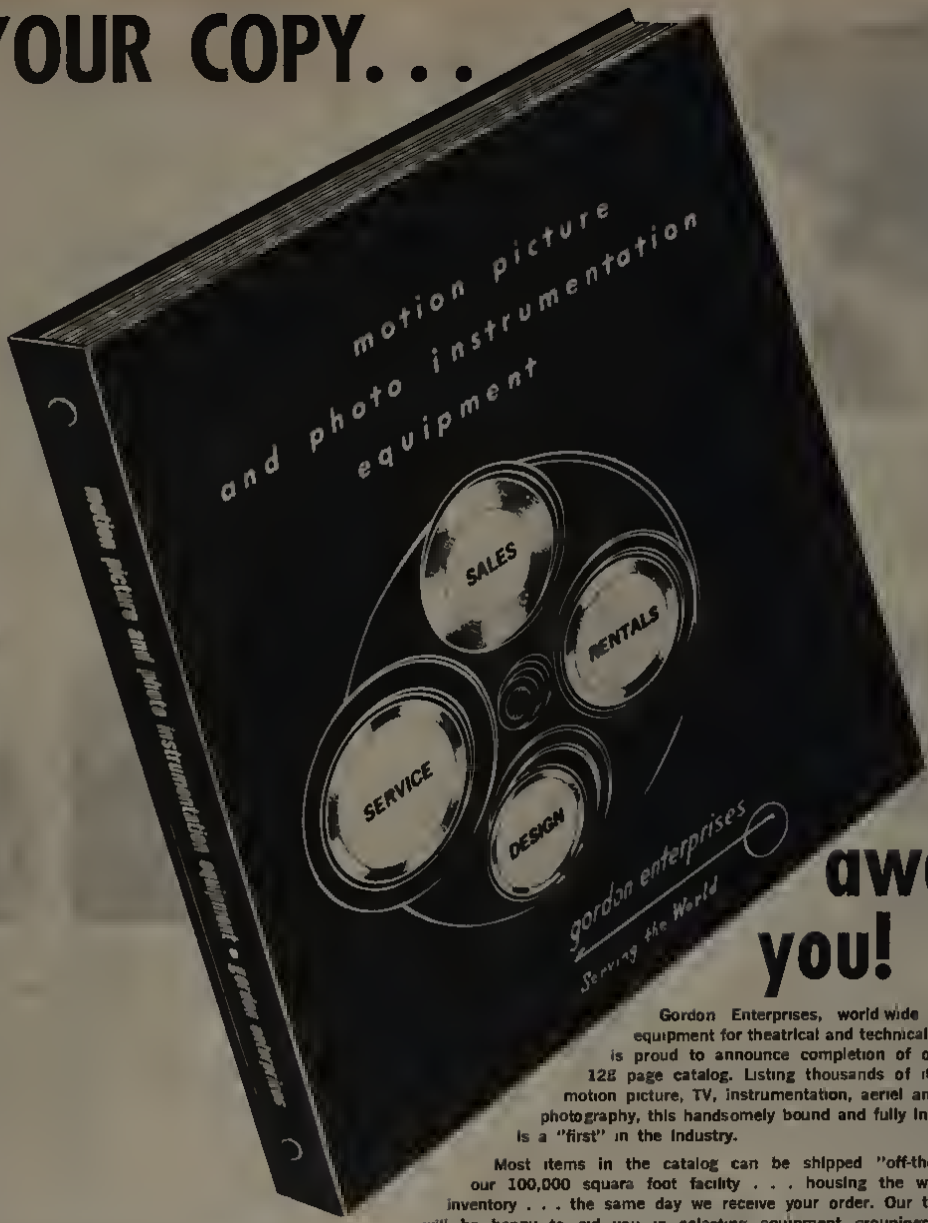

awaits you!

Gordon Enterprises, world wide suppliers of equipment for theatrical and technical photography, is proud to announce completion of our illustrated 128 page catalog. Listing thousands of items used in motion picture, TV, instrumentation, aerial and underwater photography, this handsomely bound and fully indexed catalog is a "first" in the industry.

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INDUSTRY NEWS

News briefs of industry activities, products and progress

"Oscar" Nominations To Be Announced February 26

Nominations for the 34th Annual "Oscar" Awards, including those for Best Cinematography, will be announced by the Academy of Motion Picture Arts & Sciences in Hollywood on February 26th.

As in the past, except for one year, five black-and-white and five color feature productions will be nominated for photography. Subsequently, all members of the Academy will vote in the final balloting to determine the winner in each category. Presentation of the Awards will take place in Santa Monica, Calif., the evening of April 9th.

•

Film Production Seminar

A traveling seminar on film production, of interest to both amateurs and professionals, is to be conducted by technical representatives of Paillard, Inc., distributors of Bolex cameras. A major part of the programs will be devoted to demonstrating versatile applications of newly developed equipment for shooting and projecting 8mm films. The Seminars are scheduled for 55 cities throughout the U. S., beginning January 29 and continuing to February 28. Further information, including cities and dates of the scheduled seminars, may be had by writing Paillard, Inc., 100 Sixth Ave., New York 13, N.Y.

•

"Cameraman" Ken Murray Screens His Work

Ken Murray, of stage, radio and TV fame, started shooting 16mm movies shortly after he landed in Hollywood some 35 years ago, and concentrated his shooting mainly on personalities and friends in the film industry. Recently he edited some of this old movie footage into an entertaining half-hour film which he titled, "Hollywood, My Home town," then sold it to a major TV network.

Murray later had opportunity to display his photographic artistry before the "Hollywood Pros" when, on January 22, at the invitation of ASC President Bill Daniels, he screened his memorable film for members of the American Society of Cinematographers at the Society's clubhouse in Hollywood.

•

Industry Film Awards

Industry Film Producers Assn., Los Angeles, will holds its 1962 national conference, film festival, and awards presentations in June. The conference will take place June 14 to 16 on the campus of UCLA, and the annual awards will be presented at the Beverly-Hilton Hotel. Awards will be made for best industry-produced films of 1961.

•

New Reflector Design

Ralph O. Hoge, veteran assistant director and grip who holds numerous patents on motion picture equipment, has developed a new inflatable sunlight reflector weighing only six pounds, compared to 30-pound weight of regular studio reflectors. According to Hoge, the reflector can be inflated with only a half-pound of air pressure to achieve natural density of light when shooting, and claims it gives a wider range of light on the area being photographed.

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...more than the sum of its parts!

The arithmetic of leadership was there on the drawing board, long before the first precision parts were ever machined for the remarkable Arriflex 16. Leadership was in the making as Arriflex engineers conceived the many unique features that make it today's top-performing motion picture camera! □ For example, the **mirror-reflex shutter** viewing system eliminates finder problems. The fantastically precise **registration-pin** movement in a **precision film gate** achieves such framing accuracy that even 35mm blow-up release-prints sustain rock-steady screening quality. The **divergent turret** keeps a telephoto lens barrel out of the field of a wide-angle mounted alongside. □ There's much more to this amazingly compact 6½ lb professional camera than the sum of its parts. Ask any Arriflex user!

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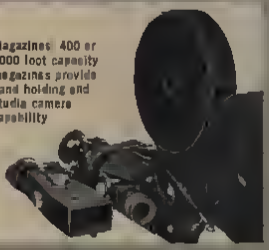

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Bolex: adventure's historian

Nothing is impossible with the new Bolex H-16 Rex, the most adventurous of cameras. That's why it was chosen by Burton McNeely as soon as it became available. A free lance photographer for 10 years, McNeely focuses on excitement in his films for Tele-Sports Digest, CBS, NBC and ABC-Paramount. Working at his specialties—sports, travel and underwater photography—he finds his Bolex "versatile and portable...a trouble free precision instrument." McNeely has taken his Bolex to the ocean floor, into the stratosphere and through sand and heat. Yet, it has required servicing only once in five years. That's dependability. Bolex features such as reflex viewing, variable shutter, film rewind, frame counter and single frame device bring out every professional effect in the script. Reflex viewing, for instance, permits McNeely to see exactly what he's shooting, enlarged six times just as it will appear on the screen. A choice of the finest optics available for 16mm cameras assures McNeely of salable results whether he's shooting from a 150 mph road racing car or filming an underwater ballet in a Florida spring. These are just a few of the many reasons why McNeely and hundreds of thousands of other users are sold on Bolex 16mm cameras. Another example of Bolex getting the job done for a professional

Bolex cameras and accessories for every professional effect.

The Bolex H-16 Rex comes with reflex viewing, variable shutter and 3-lens turret. With Lytar 25mm f/1.8 lens, only $450.00.

Vario Switar 86. Zooms from 18mm to 86mm—almost 5:1. Designed and constructed exclusively for Bolex H-16 cameras with reflex viewing. Diaphregm f/2.5 to f/22. ($420.00)

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Workmenship for all Bolex equipment is to the most precise tolerances on the 16mm market. Bolex lenses are matched for uniform sharpness, exposure and color rendition. Bolex cameras and accessories offer the professional utility many studios have paid thousands of dollars for. Write for literature and name of your nearest Bolex dealer.

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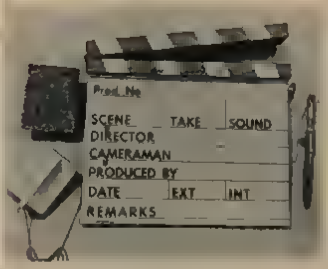
WHAT'S NEW

IN EQUIPMENT, ACCESSORIES, SERVICES



Scene Slate

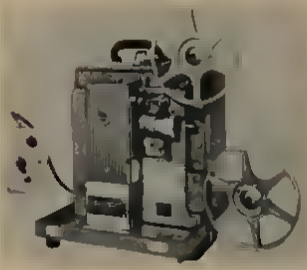
New and eminently more practical than old type slates is the CECO Quick Slate recently announced by Camera Equipment Co., 315 West 43rd St., New York 36, N. Y. New slate utilizes white Lucite as writing surface. A black grease pencil, used for marking, is attached to slate with a pull-out chain with automatic return. Clips on back of slate hold pencil when not in use, also eraser. A novelty is use of imbedded magnets to hold clap-stick in closed position. Slate measures 9½" x 11", lists for $24.95.

Professional 16mm Service

General Film Laboratories, Hollywood, and Kansas City, Mo., now offers 16mm black-and-white reversal professional service, which includes: B&W reversal film processing; B&W reversal work prints from either B&W or color reversal originals; and B&W reversal release printing. A brochure is available giving full schedule and prices.

Timing-Light Generator

A new miniaturized timing-light generator for high-speed photography, which reduces by half the size and weight of previous units, is announced by Fairchild Camera and Instrument Corp., 580 Midland Ave., Yonkers, N.Y. Designated the HS-10600, the new generator will fire up to four #51 or 51H or equivalent lamps at rates of 100 or 1,000 pips per second. Pulse duration is 30 microsec with accuracy of 0.1% at 1,000 cps. Output is 200V minimum. Unit can be operated on 100 V A.C., using its attached transformer, or direct from any 12-V D.C. source. Size is 3⅜" x 4⅜" by 6⅜"; weight, 2 lbs. 6-oz.; price, $630.



Variable Speed Projector

The L-W Photo Optical Data Analyzer is a 16mm projector which permits variable-speed viewing of 16mm films from still projection to 24 fps without flicker. Designed especially for data reduction of instrumentation film, projector provides unlimited single frame hold time, effective cooling that prevents film damage, and complete remote control of speed and direction of film travel. A daylight viewer is built-in for desktop analysis of films. Additional features include frame counter that adds and subtracts and can be re-set to zero; fast rewind, film framer and elevating control, straightforward threading; 2-in. f/1.6 coated projection lens; 750-W or 1000-W base-down bulb; and 400-ft. film capacity. L-W Photo Products Co., P.O. Box 147, Northridge, Calif.

New Idea In Exposure Meters

The Heiland Pentax "Three/Twenty-One Exposure Meter is a new concept in exposure meters, designed to give photographers full control over every light condition, from soft candlelight to dazzling sun. Because the meter's light-sensitive element covers an angle of only 3° (within a 21° field of view), it evaluates the light intensity only of the precise area to be photo-

Continued On Next Page

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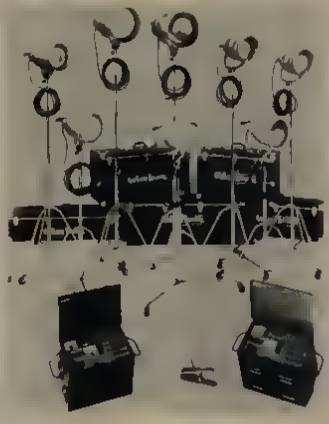
WHAT'S NEW

Continued From Preceding Page

graphed. Peripheral light does not affect the reading.

On the order of a spot brightness meter, it is ideally suited for use in sound stage cinematography. List price is $79.50. Manufacturer is Heiland Photo Products, and distribution of meter is through leading photo and camera stores.



Studio In A Suitcase

The new ColorTran Industrial Motion Picture Kit comprises 5 sturdy carrying cases of basic lighting equipment, stands and converters to supply the cinematographer's needs for most on-location filming. Included are 2 Cinemaster Mark II Converters, and 8 lights which supply the equivalent of 80,000 watts of photographic illumination on only 73 amps of current. Accessory and power cable kits are available as added refinements. Safety grounded 3-wire system is used throughout. ColorTran Industries, 630 So. Flower St., Burbank, Calif.

Equipment Catalog

Gordon Enterprises' long awaited illustrated 128-page catalogue of motion picture and photographic equipment for theatrical and technical fields is now available to qualified buyers in the industry. A request on your business letterhead to Gordon Enterprises, 5362 No. Cahuenga Blvd., North Hollywood, Calif., will bring you a copy free.

Magnetic Film Striper

The S.O.S. Sonocolor SCF2 magnetic film striping machine applies stripes to 8mm, 16mm, and 35mm films in full coat, single or multitrack patterns. One man operating the equipment can process from 2000 to 3300 feet of film per hour. Interchanging from one film size to another requires but a few minutes. Completely self-contained, the machine requires less than 14 square feet of floor space. A cylindrical one-gallon tank with motor-driven agitator feeds magnetic Sonocolor emulsion by natural gravity flow to the applicator mechanism. The solution is maintained permanently at proper viscosity. An important feature is the exhaust system which removes heavier-than-air vapors from within the applicator chamber.

Manufacturer-distributor is S.O.S. Photo-Cine-Optics, Inc., 602 West 52nd St., New York 19, N. Y., and 6331 Hollywood Blvd., Hollywood 28, Calif.

F&B Hot Splicer

Florman & Babb, Inc., 68 West 45th St., New York 36, N. Y., announces a new Acmade precision table model hot film splicer. Features include retractable film pins on the 16/35mm model which permit center placement of 16mm pins when splicer is used for A&B roll editing; stainless steel blocks with tungsten carbide scraper and cutting blades, and thermostatically controlled heater that maintains constant temperature of 100° F. Models are available for 16mm, 35mm, and a combination model for both 16mm and 35mm films. Prices are $299.00 and $399.00 respectively.

Location Lighting Kit

The Lowel Light LN16 is a complete incandescent lighting kit that includes ample equipment to meet most on-location lighting situations. The kit includes of steel reinforced vulcanized fibre case with four compartments containing 6 Lowel-Light tape-up/clamp-on lighting fixtures; 6 barn doors, 2 nine-foot stands, 3 twenty-five-foot neoprene insulated extension cords with molded 3 way outlets, 1 twelve-yard roll of Gaffer Tape; special apertures and foam padding for holding six R40 reflector bulbs; and two 25-amp fuses. Outfit less bulbs lists for $124.50. ■

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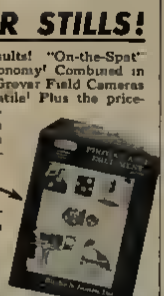

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Q & A — Technical Questions and Answers

Q.— *I plan to use the A&B roll method in editing an accumulation of footage into a commercial film. One point in this method puzzles me. If an A roll scene is 4 feet long, do I need to use 4 feet of opaque leader on the B roll? Is the match-up foot for foot? In other words, if I have 1200 feet of film, would I require 1200 feet of opaque leader to edit it in A&B rolls?*—C. N. T., Cincinnati, Ohio

A.— An article explaining the A&B roll editing technique appeared in our October, 1961, issue.

A&B roll editing is the standard method of preparing film for printing by means of a checker-board pattern of alternating scenes on two separate rolls of film, which are designated A and B. By this method it is possible to obtain invisible, jump-free splices and to produce lap-dissolves and fades where they have not been made in the camera.

Beginning with the first scene in your film, the scenes are alternated back and forth from A roll to B roll, each scene on a given roll being separated from the next by opaque black leader. At the laboratory, each roll is then run through the printer separately. The B roll prints in the areas left unexposed by the black leader of the A roll. Sometimes, frequently with titles, a third or C roll is necessary.

Q.— *The camera film and duplicating film that I use (both color) scratches readily. I have used Permafilm and Tuff Coat which have provided some scratch-resistance to these films, but they do not give me the same protection as lacquer coating on Kodachrome Regular films processed by Eastman Kodak. Is there some better scratch resistant overcoat or lacquer coating that I can apply to the films I use, the backing of which is removed during processing?* G. A., Tacoma, Wash.

A.— For the answer to this problem we went to Nicholson Products Company, manufacturers of Tuff Coat, which you state you have used, and they replied as follows:

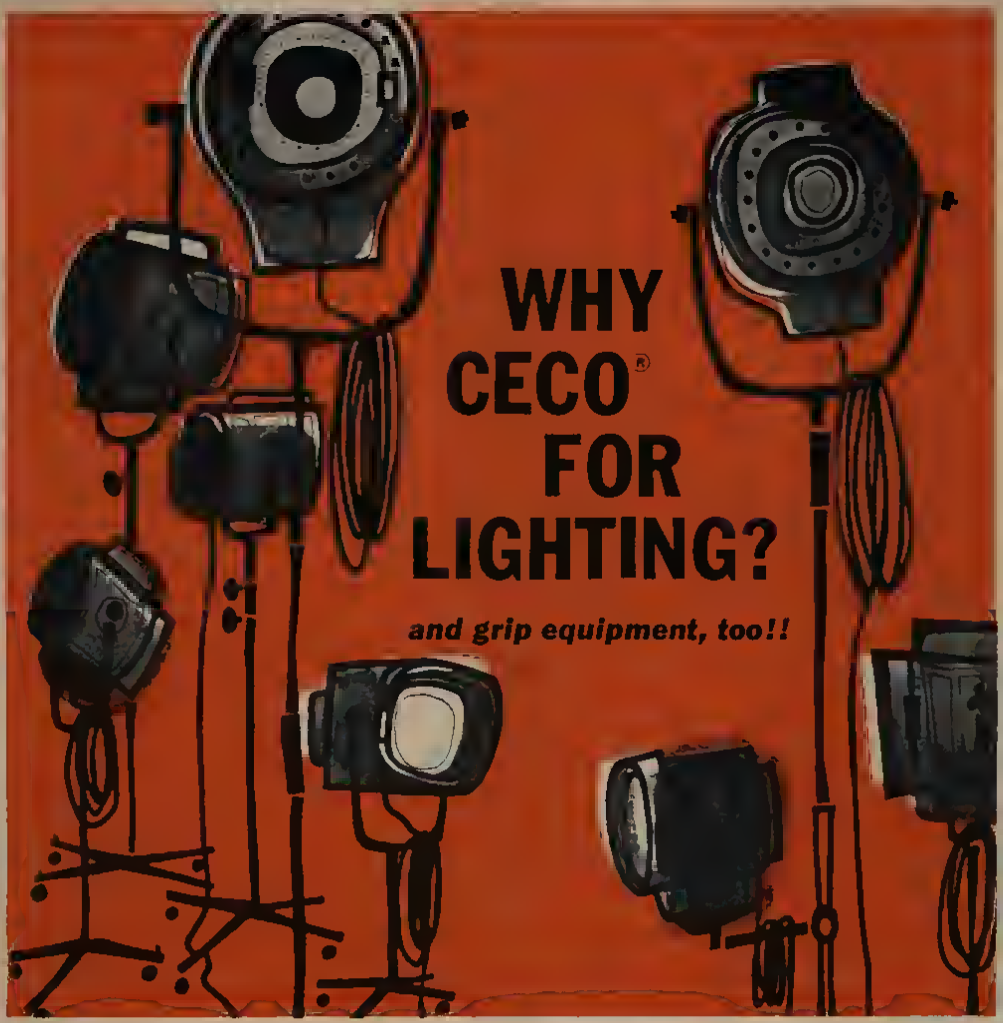
"As manufacturers of Tuff Coat, we are constantly in touch with the problems of scratching and abrading of film and we do not believe that at present there is better protection available for motion picture films, providing Tuff Coat is applied to the film surfaces as soon after processing as possible, before damage occurs. We think it significant that all of the major Hollywood studios and all but one of the independent laboratories also use our product.

"Regarding lacquering, we cannot recommend this process except as a remedial measure. It is sometimes possible to salvage with lacquering original footage that has been severely scratched, as lacquering has the effect of filling in the scratches and creating new optical planes. But it also brings with it a new set of problems because it tends to chip, peel and sometimes turns white under certain circumstances of storage. We would suggest lacquering only when it is desirable to make a duplicate of the damaged film, but we would prefer to recommend the liquid-gate printing process."

Q.— *In the article "Aerial Image and Animation" in your July, 1959, issue, reference is made to the camera being " positioned for a 10½ field." Will you please explain what is meant by a "10½ field" and why the aerial image can only be photographed when the camera is so positioned?*—E. H. L., Ottawa, Ont., Canada.

A.— The reason the setting must be for a 10½ field, advises Ed Willette of Animation Equipment Corporation, is that there is a large lens mounted directly in the table top; and for proper focus through this lens the camera lens setting must be held at the proper distance. The only variations in size of image that can be obtained must be accomplished by movement of the aerial projector head or by changing the size of the art.

A 10½ field means an area of proportions known in the film industry. Actually, the width of this field size is 10½ inches. ■



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CINE-TECHNICAL TRENDS

ASC's Research Committee Issues Recommendation

The Research and Educational Committee of the American Society of Cinematographers, following through on its program of establishing recommendations for standardization in film industry procedures, has circulated its Recommendation No. 6 on Double-Frame Camera Aperture Dimensions. These cover double-frame cameras used for wide screen motion picture photography, as described in detail in the ASC's *American Cinematographer Manual*, and are set forth in the Committee's Recommendation Report as follows:

DOUBLE FRAME CAMERA APERTURE DIMENSIONS
A S C RECOMMENDATION NO 6

1. Scope

1 1 This recommendation specifies the aperture dimensions for a motion picture camera using 35MM negative raw stock with a perforation pitch of 0.187" and having a movement stroke of 8 perforations per frame

1 2 It should be noted that the film travels horizontally through the aperture from right to left as viewed from behind the camera

1.3 The registration pins are located one perforation below the aperture to the left, as seen from behind the camera, with the full-size pin entering the lower and the horizontal fitting pin the upper perforation.

2. Dimensions

2.1 The dimensions shall be 1.486"x 0.992".

2 2 Ground glass and finder markings for these cameras, as well as detailed information with flow charts, are in accord with the *A S.C. Manual*, pages 48, 49, and 50 under Wide Screen Systems No. 3 and No. 4.

2.3 The dimensions of the negative raw stock to be used in these cameras shall be in accord with ASA PH 22 93—1956.

3. Usage

3.1 This camera aperture is identical for all motion picture cameras for theatrical production methods in both non anamorphic and anamorphic photography.

3.2 The anamorphic ratio presently used in conjunction with this aperture is 1 5:1

3 3 Negatives obtained in shooting with the recommended camera aperture are original negatives and can be used for release prints in 35MM after an optical turnover of 90° plus reduction printing.

3.4 35MM prints can be non anamorphic or anamorphic depending on the desired release print method which may also introduce an additional anamorphic printer step of 1 33:1 for a compatible 2:1 squeezed print

3 5 Anamorphic negatives described in paragraph 3 1 above can also be used to obtain compatible non anamorphic 70MM release prints

3 6 These negatives are also used within the scope of a complete transparency process, whereby however, double frame positive prints are made to use large area positive prints for single, double, or triple head transparency projection

The Society's Research and Educational Committee is headed by Walter Bever and Hal Mohr, ASC, Chairman and Co-chairman respectively. Soon to be announced, according to William Daniels, President of the ASC, is the Committee's recommendations on Cinerama camera aperture Standards, flat and squeezed release methods for films for TV, and all presently-used 35mm camera apertures

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The Bell & Howell Company has developed an electric eye-within-an-eye that lifts back-lighted scenes from the shadows. Called the Dual Electric Eye, the highly sensitive device computes the correct exposure for the subject of a back-lighted scene, compensating for the reflection of the sun's rays into the electric eye. Ordinary electric eye cameras powered by a single photocell read these extraneous rays of light, and produce an underexposed picture. The Dual Electric Eye has a second photocell that compensates for this. ■

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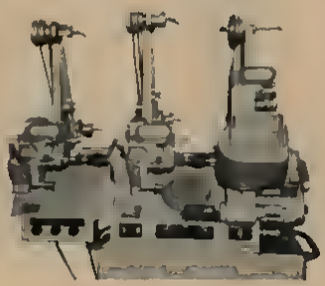

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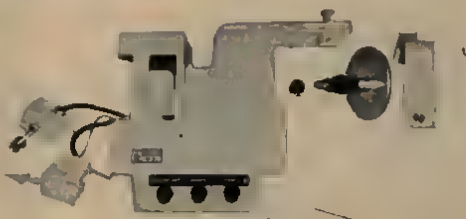

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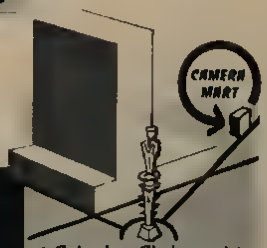

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WRITE FOR COMPLETE BULLETIN OF THIS MONTH'S BARGAIN SPECIALS

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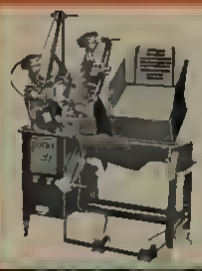

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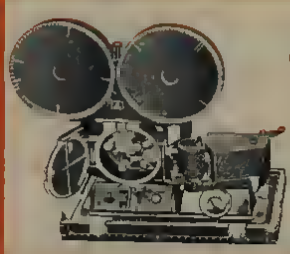

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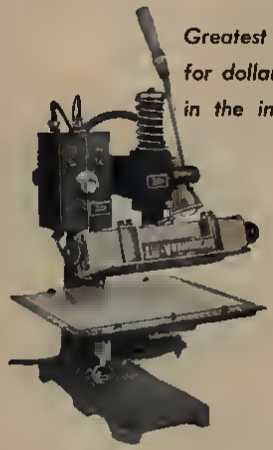

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SEE BARGAIN SPECIALS ON TWO PRECEDING PAGES

BEHIND THE CAMERAS

WHAT THE INDUSTRY'S CAMERAMEN WERE SHOOTING LAST MONTH

BY MARION HUTCHINS

NOTE Asterisks following titles indicate television film productions

ALLIED ARTISTS

JOSEPH BIROC, ASC, "Reprieve" (Kaufman-Lubin Prod.) with Ben Gazzara and Stuart Whitman. Millard Kaufman, director.

BILTMORE STUDIOS — N.Y.

JACK PRIESTLY, "Naked City"* (Screen Gems)

BIOGRAPH STUDIOS — New York

GEORGE STOETZEL, ASC, "Car 54 Where Are You?"*

CASCADE PICTURES

ROY SEAWRIGHT, Commercials*

HENRY SHARP, ASC Commercials*

COLUMBIA STUDIOS

GORDON AVIL, ASC, "Mr Smith Goes to Washington"* (pilot).

JOE BIROC, ASC, "Empire Series"* (pilot)

IRVING LIPPMAN, "The Science County"* (pilot).

JACK MARTA, "Route 66"*.

ROBERT WYCOFF, "The Hathaways"* "Medicine Man"* (Pilot)

ARTHUR ORNITZ & JOSEPH COFFEY, "Requiem for a Heavyweight" (Paramount Prod.; shooting in N.Y.) with Anthony Quinn and Jackie Gleason. Ralph Nelson, director.

WILKIE COOPER, "Jason and the Golden Fleece" (Super Dynamation & Color, Morningside World Wide Prods., shooting in Italy) with Todd Armstrong and Nancy Kovack. Don Chaffey, director.

BOB HUKE, "The War Lover" (Arthur Hornblow Prod.; shooting in England) with Steve McQueen and Robert Wagner. Philip Leacock, director.

CHARLES WELBORN, "Dennis the Menace"*, "APO 923"* (Pilot)

FRED GATELY, ASC, "Hazel"*

PHILIP LATHROP, ASC, "Experiment in Terror" (Geoffrey Kate prod., shooting in San Francisco) with Glenn Ford and Lee Remick. Blake Edwards, producer director.

PHILIP TANNURA, ASC, "Shannon"*.

GERT ANDERSEN, ASC, "Donna Reed Show"*

DESILU—Cahuenga Studios

NICK MUSURACA, ASC, "The Jack Benny Show"*

ROBERT DE GRASSE, ASC, "Dick VanDyke Show"*; "Danny Thomas Show"*.

SID HICKOX, ASC, "The Andy Griffith Show"*.

HENRY CRONJAGER, "Joey Bishop Show"*.

DESILU—Culver City

GLEN MACWILLIAMS, ASC, "The Untouchables"*.

LOTHROP WORTH, ASC, "The Real McCoys"*.

DESILU—Gower Studios

EDWARD FITZGERALD, ASC, "Victor Borge Show"* (pilot)

CHARLES STRAUMER, "Fare Exchange"* (pilot).

FRANK CARSON, "Window on Main Street"*.

CHARLES VAN ENGER, ASC, "Lassie"*

TED VOIGHTLANDER, "Ben Casey"*

ROBERT PLANCK, ASC, "My Three Sons"*

FILMWAYS STUDIOS—New York

MORRIS HARTZBAND, "The Defenders"* (CBS) Boris Sagal and Buzz Kulick, directors.

FOX WESTERN AVENUE

JAMES VAN TREES, ASC, "Dobbie Gillis"*

ROBERT HAUSER, "Bus Stop"*

RICHARD RAWLINGS "Margie"*

GENERAL SERVICE STUDIOS

ROBERT MORENO, "Adventures of Ozzie & Harriet"*.

ROBERT HAGER, "Perry Mason"*

ARCH DALZELL, "Mister Ed"*

HARRY WOLF, "Hennessey"*.

GOLDWYN STUDIOS

MEREDITH NICHOLSON, "The New Breed"*.

INDEPENDENT

ALEX PHILLIPS, "The Forsaken Garden" (Color, shooting in Mexico City) with Merle Oberon and Steve Cochran. Richard Rush, director.

BOB DOWNEY, "Candid Camera"*.

OZZIE MORRIS, "Term of Trial" (Remus Prod. for Warners Release, shooting in Dublin) with Laurence Olivier and Simone Signoret. Peter Glenville, director.

FRED YOUNG, "Lawrence of Arabia" (Super P'Vision, Eastman color, Horizon Pictures (GB), Columbia release, shooting in Spain) with Alec Guinness and Anthony Quinn. David Lean, director.

JOE MACDONALD, ASC, "Taras Bulba" (Harold Hecht Prod. for UA release, shooting in Salta, Argentina) with Tony Curtis and Yul Brynner. J. Lee Thompson, director.

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PHILIP LATHROP, ASC, "333 Montgomery Street"* (pilot).

ARTHUR ARLING, ASC, "Boys' Night Out" (C'Scope & Color, Embassy Kimco-Filmways Prod.) with Kim Novak and James Garner. Michael Gordon, director.

CLAUDE ROZIER, "Riffi in Tokyo" (Cipra Prod.) with Karl Boehm and Charles Vanel. Jacques Deray, director.

MILTON KRASNER, ASC, "Two Weeks in Another Town" (C'Scope & Color, shooting in Rome) with Kirk Douglas and Edw. G. Robinson. Vincente Minnelli, director.

LUCIEN ANDRIOT, ASC, "National Velvet"*.

Continued On Next Page

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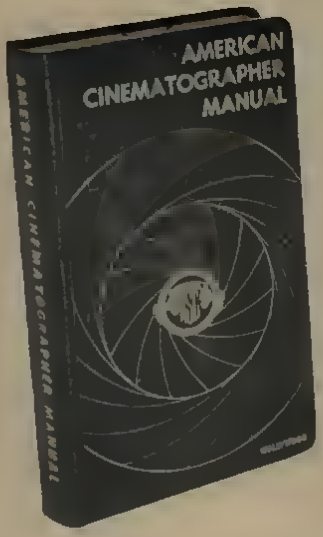

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BEHIND THE CAMERAS

Continued From Preceding Page

METRO-GOLDWYN-MAYER

HARKNESS SMITH, "Dr. Kildare"*.

WILLIAM SPENCER, "Cain's Hundred"*.

ROBERT PITTACK, ASC, "Father of the Bride"*

PAUL VOGEL, ASC, "Wonderful World of the Brothers Grimm" (MGM Cinerama, Geo. Pal Prod.) with Laurence Harvey and Karl Boehm. Henry Levin and George Pal, director

JACK SWAIN, "Rawhide"*.

JOS RUTTENBERG, A.S.C.

Photographing "Who's Got The Action" at Paramount Studios, marking first time this veteran MGM cinematographer has worked on another studio lot in 26 years

PARAMOUNT STUDIOS

JOSEPH RUTTENBERG, ASC, "Who's Got the Action?" (P'Vision, color, Amro Prod.) with Dean Martin and Lana Turner Daniel Mann, director

CHARLES LANG JR., ASC, "A Girl Named Tamiko" (P'Vision color, Hall Wallis Prod.) with Laurence Harvey and France Nuyen John Sturges, director

WALTER CASTLE ASC, HASKELL BOGGS, ASC, "Bonanza"*

JOHN NICHOLAUS, JR., "Outlaws"*

FRANK PHILLIPS, "Have Gun Will Travel"*

PARAMOUNT SUNSET STUDIOS

FLEET SOUTHCOTT, "Gunsmoke"*

LESTER SHORR, ASC, "Pete and Gladys"*

REPUBLIC STUDIOS

GILBERT WARRENTON, ASC, "Target the Corruptors"*

HOWARD SCHWARTZ, "The Rifleman"*

CHARLES BURKE, "Apartment in Rome"* (pilot).

CARL GUTHRIE, ASC, "The Third Man"*

GEORGE DISKANT, ASC, "Dick Powell Show"*.

WILFRID CLINE, ASC, "Robert Taylor Detectives"a,

HOWARD SCHWARTZ, "Mrs. G Goes to College"a,

REVUE STUDIOS

ARTHUR GRANT, "Phantom of the Opera" (Color; Ul Hammer Prod., shooting in London) with Herbert Lom and Heather Sears Terence Fisher, director

NEAL BECKNER, BENJ. KLINE, ASC, JOHN WARREN, ASC, "Alcoa Theatre"a

ELLIS THACKERY, ASC, BENJ KLINE, ASC, "Thriller"*

JOHN WARREN ASC, WILLIAM MARGULIES, ASC, '87th Precinct"*

JOHN RUSSELL, ASC, DALE DEVERMAN, "General Electric Theatre"*

WILLIAM MARGULIES, ASC, FRED MANOL, ASC, "Checkmate"a

ROBERT GOUGH. 'Bachelor Father"*

RAY FLIN, NEAL BECKNER, "Frontier Circus"*

NEAL BECKNER, "Bob Cummings Show"*

JOHN WARREN, ASC, WALTER STRENGE, ASC, "Wells Fargo"*

RAY RENNAHAN, ASC, "Laramie"*

JACK MACKENZIE, ASC, "Ichabod and Me"*

NEAL BECKNER, "Bob Cummings Show"*.

WALTER STRENGE, ASC, "Wagon Train"*

MACK STENGLER, ASC, "Leave It to Beaver"a,

DOUGLAS SLOCOMBE, "Freud" (shooting in Munich) with Montgomery Clift and Susannah York John Huston producer-director

TWENTIETH CENTURY-FOX

TED SCAIFE, "The Lion" (Deluxe color & C'Scope. shooting in Africa, Samuel G Engel Prod.) with William Holden and Capucine Jack Cardiff, director

WILLIAM MELLOR, ASC, "Mr Hobbs Takes a Vacation" (Jerry Wald Prod.) with James Stewart and Maureen O'Hara Henry Koster director

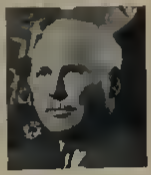
ARTHUR IDNETSON, "Nine Hours to Rama" (C'Scope, Deluxe color, Red Lion Prod., shooting in India) with Horst Buchholz and Jose Ferrer. Mark Robson, producer-director

LEE GARMES, ASC, "Hemingway's Young Man" (C'Scope & Color, Jerry Wald Prod.) with Richard Beymer and Paul Newman Martin Ritt, director

KENNETH PEACH, ASC, "Follow the Sun"a

LLOYD AHERN, ASC, "Adventures in Paradise"*

LEON SHAMROY, ASC, 'Cleopatra" (J Mankiewicz Prod.; Todd-AO, shooting in Rome) with Elizabath Taylor and Richard Burton. Joseph Mankiewicz director



RAY RENNAHAN, A.S.C

Photographs most of the "Laramie" TV films, which are produced at Revue Studios in Hollywood. Rennahan is veteran Technicolor camera man

WARNER BROS

RAY FERNSTROM ASC., ROBERT TOBEY, ASC JACK MARQUETTE, ROBERT HOFFMAN, "Hawaiian Eye"*.

JACK MARQUETTE, "Maverick"*

WILLARD VANDERVEER, "Cheyenne"*

HAROLD STINE, ASC. "Battle Zone"* (pilot)

RALPH WOOLSEY, ASC, BOB HOFFMAN, LEWIS JENNINGS, "Surfside Six"*.

LEWIS JENNINGS PEVERELL MARLEY, ASC, RALPH WOOLSEY, ASC HAROLD STINE, ASC, '77 Sunset Strip"*

RAY FERNSTROM, ASC, FRANK CARSON, "Bronco"*

ROBERT KRASKER, "Act of Mercy" (Cavalcade-Concorde Prod., shooting in Spain) with Leslie Caron and David Niven Anthony Asquith, director

ZIV-UNITED ARTISTS

CLIFFORD POLAND, (shooting in Florida) "Everglades"a

MONROE ASKINS, "Rip Cord"*

CURT FETTERS, "King of Diamonds"*.

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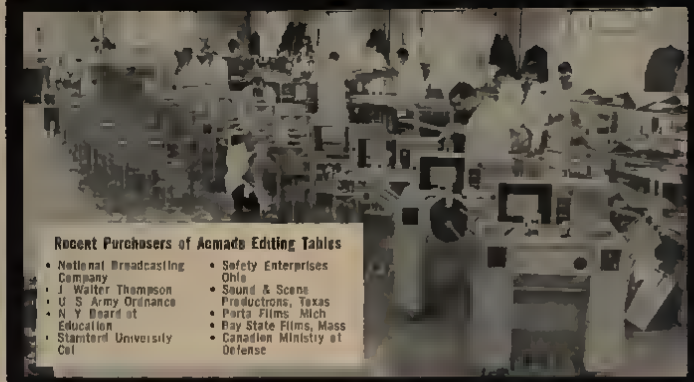

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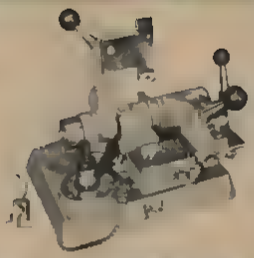

1 The combination 35mm 16mm Model features retractable 35mm and 16mm pins. This permits center placement of the 16mm pins for A and B roll splicing

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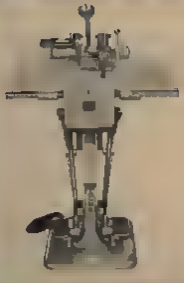

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NOT SO LONG AGO MEN imagined that strange creatures lay in wait amid the unknown reaches of the stratosphere and space beyond.

Today, what with radio probes and unmanned investigative satellites slamming around at great distances, much more has been learned about the dangers of manned space flight.

But no strange creatures. Not even a single flying saucer remains of all those once reported in our planetary vicinity.

In Walt Disney's "Moon Pilot," feature-length farce based on some of the most topical thinking of the day, we have a different story in which a redoubtable astronaut does encounter a creature—in his moon-bound capsule. It has almond-shaped, honey-colored eyes, boney-colored hair, a pert nose, red lips, two arms, two legs and speaks English with a foreign accent.

A strange creature—but only in her origin. She is beautiful Lyrae from a distant galaxy who has come aboard to see the pilot through to his destination and to romance far, far away.

It isn't often that a feature comedy is cited for its photography; but William Snyder's color photography and lighting for "Moon Pilot" easily demonstrates how imaginative camera work is as important as any other factor in giving this type story the strongest possible impact on the screen.

Since the basic premise of "Moon Pilot" is entirely scientific and actually in step with the latest headlines (and also because the Air Force is represented as the authoritative body involved), the atmosphere of realism had to be preserved throughout. Within this authentic framework, however, broad farce and fantasy are played to the hilt—relying largely on effective camera treatment to make the whole zany affair seem believable.

The Story Line

In the opening sequence, a massive rocket roars heavenward from Vandenberg Air Force Base while the top brass of the Air Force sweats out progress of the moon shot in the Satellite Control Center. Highly coordinated activity hums in the blockhouse during the countdown and blast-off. Then the action switches to the roomier, dimly-lighted, hushed precincts of satellite control. Great screens and panels chart the earth and a large segment of our solar system, providing a visual mosaic of weather trends around the world, the moon's ever-changing position in relation to the earth, and the orbital trajectory of the space ship itself. The outward course of the moon ship is marked by the progressive flashing of red lights, and its return by green—each light indicating progress in time, by the seven hours, and in miles by the thousand.

When, on the orbital trajectory screen, the space capsule is seen to have rounded the moon and sets course for home, the project is turned over to a recovery group aboard a giant "Flying Boxcar," which soon snatches the parachuting space ship from the air, hauls it aboard, and pulls out the astronaut—a slightly space-drunk chimpanzee. When a young Air Force officer is selected to become the somewhat reluctant "volunteer" to make the first human moon-orbit flight, the plot shifts out-of-this-world in more ways than one.

On a last three-day leave to visit home and mother, the officer keeps encountering a mysteriously beautiful girl who seems to pop up out of nowhere. He suspects she is a foreign spy until she confesses that she is from another planet and has come to warn him that the chemical coating on the rocket is unsafe and must be changed if the astronaut's sanity is to survive the flight.

Practically with the speed of light, an interplanetary romance develops between the officer and his outer-space cutie. Evading a cordon of Federal Security agents sent to keep him incommunicado until

SCHEDULED FOR A flight to the moon, Captain Richmond Talbot (Tom Tryon) center, helps load a space capsule aboard flight transport in this scene from Walt Disney's "Moon Pilot"

Some highlights on the filming of

"MOON

By HERB A. LIGHTMAN

All photos © MCMLXI by Walt Disney Productions

EN ROUTE TO THE MOON, astronaut Talbot checks in with satellite control center to report some strange goings on in "Moon Pilot," photographed for Walt Disney by William Snyder, ASC

PILOT"

...wacky, tapical Walt Disney comedy.

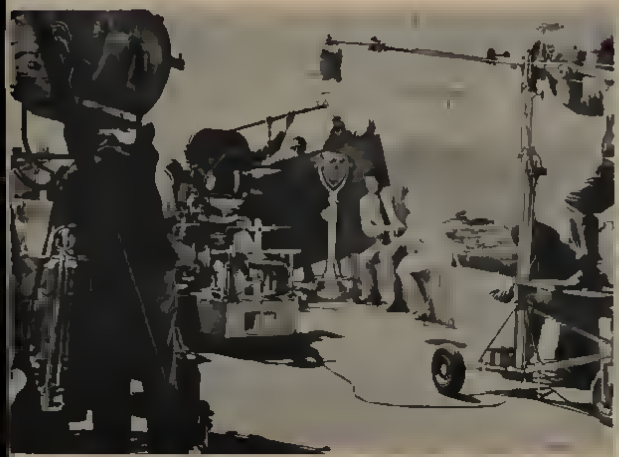
flight-time, the officer sneaks out of the barricaded hotel room for a rendezvous in the park with the girl. The authorities, certain that he has been lured away by a foreign spy, set up a dragnet and engage in a chase through Chinatown, Fisherman's Wharf and other picturesque sections of San Francisco. He is finally corraled and stuffed into the space capsule which is launched moonward with no further ado. However, he is no sooner space-borne when the girl materializes in the cabin of the space ship and invites him to her home planet for their honeymoon. When last seen he is happily going AWOL on an interplanetary scale, while the general in charge of the ground operation shouts himself hoarse on the space radio.

The Photographic Approach

Cinematographer Snyder is so successful in lending an air of visual reality to these improbable goings-on that the film, up until the time the gags begin to fly, has the authentic feel of a serious technological report such as the National Aeronautics and Space Administration might sponsor. The illusion is heightened by the use of striking Air Force footage of actual rocket launchings printed in to the television scopes in the control room.

In commenting on his photographic approach to a feature like "Moon Pilot," Snyder explains: "Every cameraman likes to go dramatic with angles and lighting for visual mood. I'm just like the rest in that respect. But in shooting a comedy you can only go so far—and it's important to know where to stop. I don't mean that comedy has to

Continued On Page 118



THE MITCHELL CAMERA, mounted on a crab dolly, is lined up for an important shot of Tom Tryon and French actress Dany Saval for "Moon Pilot." Location is Coit Tower promenade, San Francisco.

TWO "BRUTES" SUPPLY booster light for shooting this scene on a San Francisco street for "Moon Pilot," photographed on Eastman Color negative by William Snyder, ASC (left center, in white coat)

FOR CLOSEUPS of skier in action, cameraman reclined on toboggan drawn by two fellow skiers and photographed with Arriflex camera hand held

MOVING-CAMERA SHOTS ON SKIS

How the thrilling action shots were filmed for "Fantosy On Skis" for Walt Disney's Wonderful World of Color television show.

By MIKE MURPHY

NORMALLY, A CAMERAMAN assigned to film an avalanche of snow would be content to set up his camera at an aesthetic, and safe, distance from the slide. Recently, however, we added a new dimension of realism to avalanche photography by filming a snow slide from the middle, sliding down hill along with it.

This was only one of the challenging situations we encountered while filming Walt Disney's "Fantasy on Skis," an hour-long presentation which will be premiered on "The Wonderful World of Color" television show on NBC during the 1962 season.

In addition, we shot thousands of feet of 16mm color film of some of the world's finest skiers in action, with much of the footage shot by cameramen on skis themselves. Other shots were made by cameramen on toboggans—occasionally, I shudder to add, runaway toboggans.

Also, we filmed a complete "dream" sequence—a ballet performance on skis—also a night sequence involving a search by torchlight over the slopes of the rugged Rocky Mountains.

The entire production was filmed on location in Aspen, Colorado, where writer-director Fred Iselin maintains a lodge and ski school.

Frequently, production was slowed by blizzards, sub-zero temperatures and generally poor winter lighting conditions. Freezing and frozen cameras were a problem, as were freezing and frozen cameramen.

All told, it took five months of almost daily shooting to get the footage needed to complete "Fantasy on Skis." Eighty thousand feet of 16mm color film was exposed to obtain the approximately 2,000 feet used in the final production. However, we were prepared for this when we arrived in Aspen in December of 1960.

The cast required was drawn completely from local talent. The star of "Fantasy on Skis" is nine-year-old Suzy Wirth, an Aspen resident and the daughter of a Swiss skiing family. Rugged Suzy, who has been on skis almost since the day she started to walk, was probably the most durable member of the company, maintaining a winning grin in temperatures which would have frozen the claws off a polar bear. In addition to Suzy, several famous Olympic skiers had supporting roles.

We used four 16mm cameras in filming "Fantasy on Skis"—two Arriflex, a Bolex H-16 and an Eastman Kodak K-100. The film used in production was Eastman Ektachrome Commercial Film, Type 7255, balanced for interior shooting at

Continued On Page 110

SHOOTING ONE of the several interiors on location in Aspen, Colorado's famed skiing center. The Arriflex 16 camera is hand held for closeup of St Bernard dog which figures prominently in "Fantasy On Skis." Picture was shot entirely on Ektachrome Commercial 16mm film, then blown up to 35mm color

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Cinematography In The Atomic Age

ATOMICS INTERNATIONAL cameraman, Jerry Bettgn focuses the Arriflex-16 on scope of electronic measuring instrument for closeups showing molecular ochen of graphite particles highly magnified

How the in-plant matian picture unit of Atomics International meets the hazards of filming in areos of rodiation.

By DARRIN SCOT

Cinematography—in its many theatrical, commercial, industrial and scientific applications—often involves certain occupational hazards which frequently threaten the life, limb and general welfare of the cameraman. Perhaps the most dreadful of these hazards, an inevitable result of the Atomic Age, is the possibility of injury or death resulting from overexposure to deadly radiation. Although they tend to underplay the seriousness of this constant threat (perhaps because "positive thinking" is necessary to their peace of mind in the pursuit of their chosen profession), the cameramen of the in-plant film production unit of Atomics International daily expose themselves to such danger in order to further man's knowledge of nuclear energy and the conquest of space.

Scope of Activities

Atomics International, the nuclear research division of North American Aviation, Inc., near Los Angeles, serves the Atomic Energy Commission in two main areas of activity: (A) The development of nuclear reactors for peaceful civilian uses, and (B) the design and construction of special nuclear reactors for developing electrical power for satellites and payload vehicles in space. The latter program is familiarly referred to as SNAP (Systems for Nuclear Auxiliary Power).

In filming such research projects, the A-I Motion Picture Unit wages a constant campaign against contamination of equipment and the exposure of its personnel to unsafe amounts of radioactivity. An account of a recent assignment will graphically illustrate the enormous precautions that are taken to control the risks involved.

An unprecedented problem developed on a research project known as the Sodium Reactor Experiment. Damage to fuel elements and moderator cans had occurred deep inside the core or "hot cell" of the reactor. A crew had been assigned to attempt the removal of the damaged parts and the repair of the mechanism entirely by means of remotely controlled manipulators. Such a repair had never before been accomplished and, for this reason, it was decided that color motion pictures be made to record the attempt.

The reactor was located in a building 190 feet long and 90 feet wide. Since the entire area was contaminated, it was deemed inadvisable to bring into this area any permanent or elaborate portable lights. In view of the problem, the A-I film unit elected to use high-speed Ektachrome 16mm film and to light the huge area with sixteen clamp-on light units with 750-watt lamps. By carefully placing these lamps it was possible to get more or less uniform illumination for shooting at f/2.8 at 24 frames per second.

Complicating things further, the two photographers had to do their shooting without interrupting any work that was in progress. They alternated in 12-hour shifts to provide constant coverage for the round-the-clock operation—and continued in this way for the six weeks required to make the necessary repairs on the reactor.

TYPICAL LIGHTING setup used to illuminate scenes for instructional film on fabrication procedures in an aircraft plant. Note sandbags on tripod triangle to prevent slippage; also the simple lighting setup

THREE CAMERA setup (all Arriflex 16's) to record action of fuel changing in a large atomic power reactor—a typical filming project undertaken by the in-plant motion picture unit of Atomics International, Los Angeles.

Whenever either cameraman entered the work area he had to strip completely and don special coveralls marked with red hands which are regularly worn in radioactive situations. Additional protective gear included cloth shoe covers, then plastic shoe covers, cotton gloves, rubber gloves, face mask and hat.

Everytime a cameraman picked up a piece of equipment in the area, he had to change gloves. The technicians working on the reactor repair usually wore one pair of gloves continually for an eight-hour shift, but the cameramen used at least a dozen pairs of white mortician's gloves during each twelve hour shift. All photographic equipment, including the camera, was inclosed in plastic bags, to prevent contamination. Film reloading under such conditions was especially difficult.

The Problems Encountered

The most critical phase of filming the reactor repair project involved shooting directly into the hot cell of the reactor. The shield surrounding the core was six feet thick and weighed 75 tons. Inside the shield were tiny mercury vapor lamps, the sole source of illumination. The inside area of the reactor is approximately eleven feet wide, and an extreme wide-angle lens permitted coverage of about half that area, showing the top of the reactor, as well. The repair technicians had been provided with a small observation window so they could look into the core and manipulate instruments for the removal of debris, moderator cans and fuel elements. The window, six inches in diameter and twelve inches thick, was made of leaded glass. It was so thick and so yellow in color that shooting through it with an exposure of f/2, at eight frames per second, produced results far from satisfactory. The cameramen requested a clear plastic window through which to shoot. The Health Physics Department, assigned

Continued On Page 121

WHEN Atomics International developed a small reactor unit having promising non military uses, the news was televised nationally through films made by A I's film unit. Cameraman Milt Clemens shoots a closeup of illustration of reactor in hands of two A-I engineers for the TV news film.

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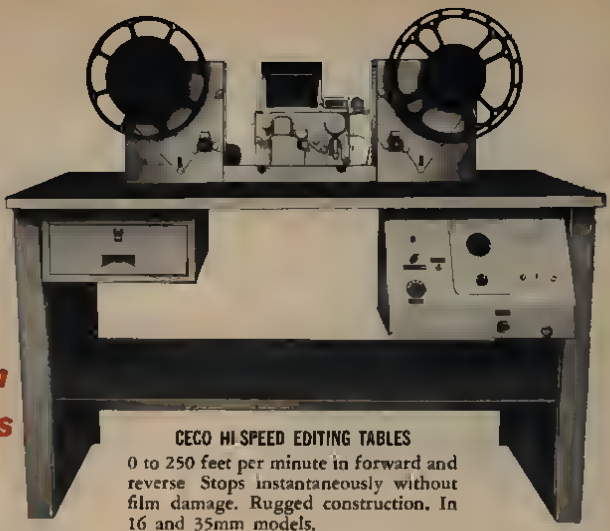

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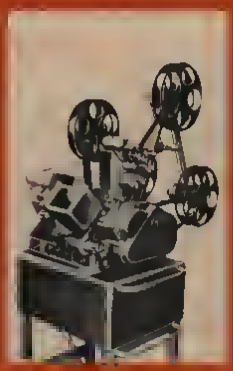

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TYPICAL USE OF process screen on sound stage. Projected from rear is background plate or scenic background photographed from a moving camera car. Dialogue action is played in front of screen by actors seated in "breakaway" automobile, and photographed by the camera (far right)

THE SET UP AS seen by the cinematographer from behind the camera, which is so positioned that only the actors, part of the car and a corresponding portion of the process screen is taken in by the lens—as shown in picture below, right

The Photography Of Background Plates

How scenes are shot that are combined with live action in front of the process screen.

By FREDERICK FOSTER

A BACKGROUND PLATE, in the parlance of the motion picture industry, is a scene photographed either as a transparency or as a motion picture specifically for process photography, wherein the plate is projected onto a translucent screen from the rear, and in front of which screen action is performed and photographed.

Through the use of such background plates and process photography, it is possible to photograph scenes that would be impossible to shoot otherwise because of the danger involved; the great distance that would have to be traveled, where the scene is one in a foreign land or distant state; or where it would be difficult to record sound satisfactorily as the scene was being photographed, as in the case of persons traveling in an open car on the highway, etc.

Where no action or movement is required in the background, the plate is often shot as a transparency, and then screened by a suitable projector on a process screen as the actors are photographed in action in front of it. The majority of plates used in Hollywood studios, however, are action scenes and therefore are photographed with a motion picture camera. Background plate photography is an exacting science that requires, in addition to high photographic skill, use of a precision motion picture camera having register pins in the film movement to insure maximum steadiness in the photographed image. Since the plates will subsequently be repho

tographed in combination with a live foreground scene in which there will be solid set pieces, in addition to the actors, any abnormal movement in the projected image of the plate will show up noticeably against the steady, unwavering objects and set pieces in the live action set photographed in combination with it. The result of this, of course, will be to call attention to the process photography and perhaps disillusion the audience.

The motion picture camera used for background plate photography should afford use of the full or maximum aperture, although cameras having the Academy aperture are often employed for this work. The full aperture, of course, provides a greater image area, and requires slightly less magnification in the subsequent projection with consequent reduction in grain.

For obvious reasons, the matter of grain is extremely important in black-and-white process photography of the plates required for the process. For this reason, negatives of medium emulsion speed are most generally used in shooting BG plates; besides the minimum of grain, such negative stocks also provide good contrast and overall tonal quality. Color films used for BG plates, of course, present no grain problem.

When shooting a plate, exposure should be on the full side, and when there is any doubt about it, it is advisable to slightly over-expose rather than risk an inadequately exposed negative. For satisfactory plates, crisp, full-scale prints having rich blacks and clean highlights are most desirable. A "muddy" print, made from a thin, under-exposed negative is unsatisfactory for process work and would be very difficult to match when the composite process scene is photographed.

THE COMPOSITE scene as photographed. Scenes such as this are invariably shot by process to permit simultaneous recording of important dialogue, which would be difficult to record if the scene were shot with the car and its occupants actually traveling on a highway.

PROCESS "PLATES" or backgrounds are often photographed while a company is filming on location, to permit exterior action with important dialogue to be photographed under controlled conditions on the sound stage. Planning such a shot here are operator George Nogel (behind camera) and Warner Brothers' director Delmer Daves.

Scenes having substantial backlight should not be photographed for BG plates, because of the difficulties they would present in matching the lighting of the set and action staged before it on the sound stage.

There are two general types of background plates for motion pictures: stationary and traveling. A stationary plate is photographed with a rigidly fixed camera. Knowing exactly how and for what purpose the plate will be used is a great aid in setting up the camera to record it. An important factor in shooting stationary plates is achieving the proper perspective with the correct vanishing point that will provide an apparent match with the foreground scene in the final composite picture. Unless the vanishing point is properly positioned the linear convergence in the foreground scene will not match that recorded on the plate. Camera elevation and tilt and horizon placement must therefore be given serious consideration in order to meet these requirements.

When plates are shot to script, the cameraman is usually provided with sufficient data to do the job properly. Stock plates, filmed for library use, are a little more difficult since they must be photographed in a manner that will allow using them in a more general way to suit various situations.

An excellent method for insuring accurate match

Continued On Page 114

TIME-LAPSE PHOTOGRAPHY OF THE SKY*

How specialized equipment played on important port in photographing a motion picture that traces the natural phenomenon of atmospheric change.

By PADDY CAREY, CSC

IMAGINE A MOTION picture that can actually trace the atmospheric changes in both sky and landscape from dawn to dusk, and you have "The Sky Project," a new film produced by the National Film Board of Canada and created and directed by John Feeney. Almost the entire film was shot in time-lapse, or at a very low camera speed, with locations in Southern Alberta. The project was filmed in 35mm Superscope for theatrical release early in 1962.

Many are familiar with the time-lapse studies of opening flowers, but to transfer that technique to the study of clouds is perhaps not too well known. In this intricate field, the NFB has two experts in Wally Gentleman, CSC, and Joe Durden. Without Gentleman's amazing knowledge and help, there just would have been no "Sky Project." Same goes for Durden who has pioneered in time-lapse. His recent film, "Fish Embryology" is one of the finest controlled work of time-lapse and photo-micrography we have ever seen. This work will certainly become a standard "textbook" in universities throughout the world.

As the cameraman on this project, I naturally approached this assignment with a certain amount of trepidation. Technically speaking, the Sky Project is the story of motion picture equipment. In fact, early in the job we wondered which was winning, the gear or ourselves. We had 2 cameras, 5 motors, 16 lenses, a 110-V generator, about 50 glass filters, and stacks of gelatins, a friction-head tripod, a geared-head tripod with motor drive and control panel, an electronic timer, a battery and many other gadgets, bits and pieces. Moreover most of this gear was in constant use.

Used Wide Range of Exposures

Cameras were Bell & Howell with a Mitchell rack-over. For time-lapse and low-speed work, there were two Acme motors: one a continuous motor with a range from 24 fps to 1½ fps, the other a stop-motion motor giving shutter speeds from ¼ sec. to 4 secs. and which can also run continuously. To operate the latter, we used an electronic timer built at the NFB by Stan Cole according to a design by Ches Beachell.

Range of intervals available was from one sec. up to 30 minutes. With the high speed motor reaching 125 fps, we could obtain a total range of camera speeds from 125 fps to one frame every 30 minutes, and exposures from 1/250th sec. up to 4 seconds. Most of the work ranged from 6 fps to one frame per 20 seconds including everything in between. Our longest exposure was 2 seconds.

We had a range of lenses affording eleven different focal lengths from 18.5mm to 600mm, using 8 of these regularly. With so many different lenses and ranges of exposure we required numerous neutral density filters in various shapes and sizes, with factors up to 3,000. The heaviest was actually the 3.0 N.D. with a factor of 1,000. To avoid the necessity for making quick calculations, filters were used to cancel out the increased length of the exposure over that for 24 fps.

N.D. Filters Widely Used

If we were shooting at 3 fps (8 times more exposure than 24 fps), we would use a filter with a factor of 8 and read the meter as though we were shooting at 24. On the time-lapse motor, which was scaled in even seconds and fractions of seconds, 1/64 reading was used instead of 1/50. For instance if we wanted to shoot at ½ second (1/64 x 32) we used a 1.5 N.D. filter (factor 32). Much of the time-lapse footage was filmed with this combination.

In shooting the sun, N.D. gelatins were never used as the image could easily buckle the gelatin, and in cases of long-focus lenses, might burn a hole through

Continued On Page 108

*Reprinted with permission of *Canadian Cinematography* magazine The author is a member of the Canadian Society of Cinematographers, thus the initials, CSC, following his name above —Ed

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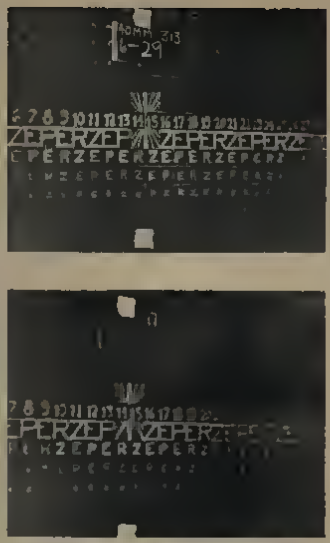
AUTHOR'S CAMERA SET UP for making camera and lens check. Camera is positioned at 45 degree angle to chart, which is homemade and has alphabet characters in graduated series plus central focus point. Card bearing lens identification data is taped on chart prior to shooting each test.



RESULTS OF two filmed tests. Chart on lens No. 313 (top) indicates sharp negative and accurate focusing calibrations. Compare this with results of lens No. 217 (bottom) which shows marked lack of sharpness.

A "Do-It-Yourself" Lens And Camera Accuracy Test

When a new or rented lens or camera is to be used for the first time, here is a quick method of testing both for accuracy that will eliminate post-production headaches.

By ROY ZEPER

INDUSTRIAL AND in-plant cinematographers who occasionally use rented cameras and lenses can reassure themselves of the accuracy of such equipment by subjecting them to photographic tests they can make easily within their own working quarters. Short lengths of film exposed with each lens and camera, is processed quickly by simple, if unorthodox methods, then formed into a loop and examined by continuous projection.

Even the lenses and cameras regularly used in production should be checked occasionally for accuracy to insure they perform with maximum efficiency. Faced with the customary pre-production avalanche of details, the in-plant cinematographer seldom has time to make extensive tests of his equipment. Still, whenever a rented camera or lens is received, virtually on the eve of starting a new production, as so often happens, the quick lens-camera test described here can eliminate many of the variables and uncertainties that worry a cameraman until he beholds the dailies or the work-print on the screen.

To make comprehensive tests of a camera, lens or both, it is only necessary to photograph a test chart, develop the film, then screen it. Most of this routine can be performed in a corner of one's studio. Because many lens test charts available commercially are too small for this do-it-yourself method of testing, the larger chart can be made by the photographer himself. The one shown in the accompanying photos was hand-lettered on a sheet of white cardboard 20 by 30 inches in size. On its surface alphabet characters were lettered in rows, with each row diminishing in size, as shown.

In the center, a clearly-defined focusing point was drawn—all this in India ink with a lettering pen.

The chart was then tacked on a wall and illuminated by a single light source. The camera was positioned on a level with the chart and at a 45-degree angle to it, at the required distance to take in the complete chart.

In shooting tests such as described here, the camera lenses to be tested should first be thoroughly cleaned, using a recommended lens cleaning solution and cleaning tissues. To identify the lens used in each test photographed, a 3"x5" card bearing data relating to the lens (large and bold enough to be read from

Continued On Page 124

A LAB PROCEDURE not condoned in standard film processing circles; nevertheless it gives fast, direct answer to camera and lens efficiency. Exceptionally short strips of film exposed makes this hand processing method feasible

TO PROJECT test film, it's formed in a loop and projected continuously. Free-spinning film reel (left) is mounted on lamp stand at rear of projector, facilitates free flow of film loop.

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THE LIGHT PILOT interposed between lens and camera, automatically modifies intensity of light during photography to maintain consistent exposures. Andre Coutant, the inventor, is shown with the equipment.

LIGHT PILOT

French invention provides automatic electronic control of exposure for motion picture cameras.

By HANS KOEBNER

ANDRE COUTANT, French cinematographic engineer, whose notable inventions and developments include the Eclair Camerette, Cameflex, Aquaflex, and the Came-300 reflex cameras, recently patented a practical and relatively simple automatic electronic exposure control for professional motion picture cameras. It was demonstrated and received wide acclaim at the recent 3rd Biennale International Photo Cinema Optique in Paris.

Trade-named the Light Pilot, the device, which is interposed between the camera and lens, automatically adjusts the incoming light en route to the film by means of a rotary graduated ND filter disc, which reduces the light intensity according to impulses received from a photoelectric cell.

In the U.S., the application of automatic exposure control to motion picture cameras has been mainly in the field of amateur 8mm and 16mm cameras and for flight data recording and instrumentation cameras. (See *American Cinematographer* for April, 1959, Pg. 234.—Ed.).

Unlike automatic exposure con-

Continued On Page 118

FIG. 2

FIG 3

LIGHT PILOT, with 210mm lens attached, is shown in Fig. 2, below left. Various components of the unit are shown in the diagram, Fig. 3. 1, lens; 2, film; 3, front surface mirror; 4, photocell; 5, collecting lens; 6, electronic cell; 7, motor; 8, gears and 9, graduated ND disc.

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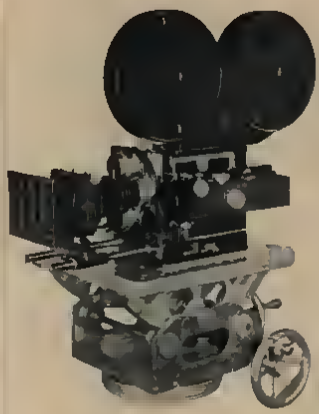

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TIME LAPSE OF SKY

Continued From Page 100

it To overcome this, the NFB devised a filter holder for series VI filters to fit over the back of the 1.f lenses This posed another problem, though, in that the glass filters materially altered the plane of focus so that it was imperative to focus with the filters in the holder. It was much like focusing through film with heavy filters on.

Our filters included N.D. grads and fog grads, the former being used on sunrise and sunset shots (to get some tone into the landscape) while holding the exposure on the sun and sky Occasionally a fog grad was used at the same time to spread the light on a rather weak sunset or sunrise On the sunset shots the exposure varied continually and even varied within them too

It took a little experience to judge the brightness of the light and to ascertain the best exposure to hold the extremes during the time the sun rose and fell It was indeed very tricky It was necessary to expose differently for different focal lengths. With a 300mm on the horizon and a 50mm covering the sky and the horizon, an exposure which might be just right for the bright horizon would underexpose the sky in the wider angle

If there was a brilliant sunset, the difference would not be as large as a small brilliant spot near the sun To forecast a good sunset was also very tricky, because in time-lapse, shooting began before the sky started to develop so that we wasted much time patience and film At times while the exposure varied, for a good sunset it would run around f/16 on a 150mm lens After the sun went down, light would rapidly drop with the richest color at about f/3 5 on a wider angle.

A sitting compass is imperative to gauge with accuracy just where the sun will rise or where it will set With a 300mm or 600mm lens, a fractional error can spell failure. It was also easy to err on the sun's movement Occasionally I caught it sliding across the bottom half of the frame when it should have been moving across the middle.

During the day, we speeded up the sun much more than at dawn or dusk. The high sun moving above the trees was shot at one frame every 10 seconds with a 75mm and at one every 5 seconds with a 105mm The same speed applied to movement of shadows up and down the mountains and through the forests Clouds developing, both moving and dispersing, were shot at one frame every 2 seconds.

One piece of equipment that is an innovation was the "motorized geared head" that enabled us to introduce camera movement in time-lapse The NFB designed and built this machine especially for the assignment. It consisted of a Bodine motor and reduction gear, one each to fit on the pan and tilt drive shafts of a Worral geared head It was panel controlled with a Variac for each motor and switches for up and down and left and right movements

The available speeds were from .6 degrees per minute to 6 d.p.m on the pan and from .13 d.p.m to 1 2 d.p.m. on the tilt However, weather conditions precluded the use of this equipment, which was a pity, as tests showed that camera movement gave the cloud material a new dimension and a dynamic life The big thunderheads and magnificent skies on the prairies just didn't materialize and B C forest fires made the sky very hazy after rain

The best cloud formation we encountered had to be chased some 60 miles to shoot, and here we encountered the first opportunity to use our motorized gear head

On an earlier rainy day, we had timed the movement in degrees per minute at various settings on the Variac scales With the help of the ASC handbook and notes from previous tests we worked out a rough table of settings for a medium camera movement at any given camera speed (and a rough of focal lengths) Obviously a pan that is just right for 1 f-p-s is going to be fast at 1-f-p 2s, etc.

Next year, we plan getting back west to shoot more material for the prairie sequences and we are confident that given clear skies and good cloud formations, the motorized tripod head should come into its own. ■

One of the first methods that comes to mind when sky darkening is mentioned is the use of a polarizing filter This filter polarizes skylight, and when placed over the camera lens it cuts out half the light coming from all objects and darkens relatively more those areas in which light is normally polarized.

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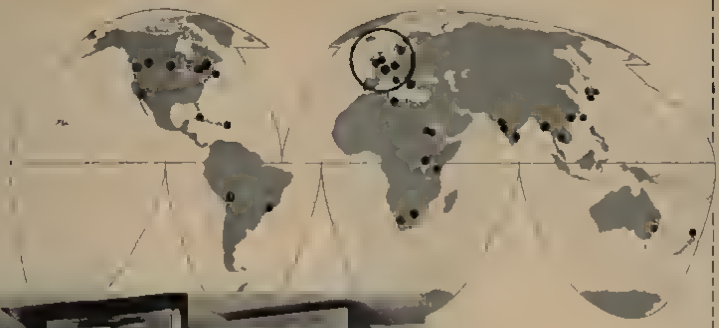

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MOVING CAMERA SHOTS

Continued From Page 92

3200°K. A Wratten 85 filter was used on all daylight exterior shots.

The 16mm color film gave us the ease-in-handling that was essential to photograph these scenes. However, we felt it necessary to make blow-up prints for 35mm color television release in major markets. To do this, the laboratory at Disney Studios made a 35mm blow-up color corrective mask by running the original 16mm color film through an optical printer, using a red filter to print on Eastman Plus-X Panchromatic Negative Film, Type 1231.

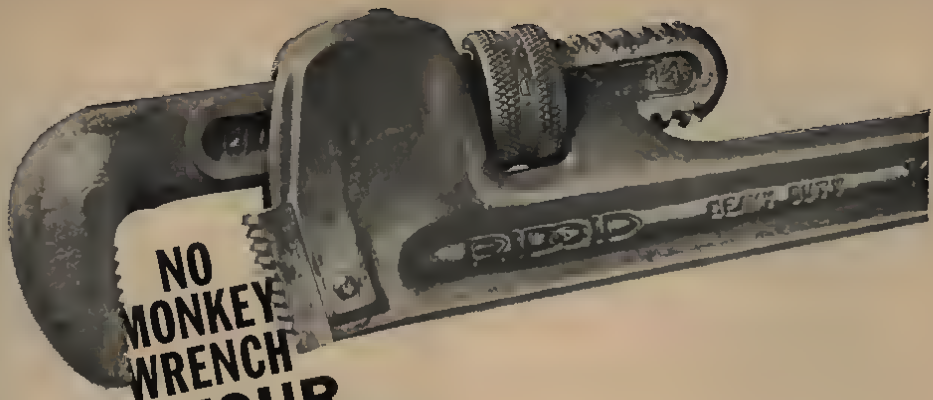
A series of relay lenses were used to register the color corrective mask and the original camera film in the optical printer in order to obtain the desired negative, using Eastman Color Negative Film, Type 5250. Color prints were made directly from this for 35mm television release.

Once we began shooting, we discovered there were certain strict photographic rules which have to be followed in snow country. For one thing we had none of the advantages which flexibility in lighting offered—conditions had to be perfect. We could not shoot on overcast or cloudy days because the backgrounds washed out and lost definition. Snow became a dull chalky expanse.

Even on bright days, however, when lighting conditions were good, shooting time was limited. This was because we were forced to shoot either early in the morning or late in the afternoon to take advantage of the slanting light and longer shadows which heightened contrast and gave depth to scenes.

Exposures are almost always a matter of individual judgment. Shooting a fast moving skier against a background of snow calls for a careful balance between figure and background. If the shot is exposed for the texture of the snow, the figure in the foreground is far too dark. If we expose for the figure, the snow "burns out."

To offset this, we used two light meters, a Gossen incident light meter and a Weston reflected light meter. For each shot we took readings on both meters then balanced between the two. In our camp we had a waggish rule of thumb: "Take ten careful readings. Then guess."



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However, experience showed that our exposures were falling within a constant range. At normal speeds, our daylight exposures ranged from f/8 to f/16, with f/9.5 being used most frequently. The lens aperture was wider for closeup shots, more closed for long shots. We did not bracket exposures. Each day's shots were processed then screened for glaring errors.

It took three weeks to film the avalanche sequence, although the scene itself lasts for a scant two minutes on the screen. During this time, a dozen different snow slides were sent roaring down the slopes of Mt. Ajax.

In this sequence, the story called for Suzy Wirth to be trapped, knocked flat by the avalanche, sent sprawling down the mountain, and finally buried in the snow. In a succeeding scene, Suzy is dug out and rescued by a St. Bernard dog.

The slides were photographed from four angles—top, bottom and two in the middle of the action. Other camera action included closeups of Suzy, supposedly trapped in the avalanche and sliding downhill, as well as angle shots of the sliding snow from Suzy's viewpoint as she tumbles down the mountain.

To set up these slide shots, we first trekked around the mountain looking for snow piles at the tops of rises which were ready to rip; (all our avalanche sequences were photographed after the regular ski season had ended and slide conditions were prevalent everywhere on Mount Ajax.) The snow had to be fresh and light enough to flow downhill smoothly while throwing up spectacular clouds of spray. In some instances, snow cornices at the brinks of precipes were chopped down to start a slide.

When we found a likely spot we placed our cast and set up the cameras at the lip of the snowpile. Then the slide was triggered by pushing the snow off with shovels. Suzy would go first, with a cameraman following about 10 to 15 feet behind—filming her reactions, while sliding down hill in the snow on his stomach.

Next, the cameraman would slide alone down the hill, taking shots of the snow as seen from Suzy's viewpoint.

Needless to say, the avalanches in which people appeared were somewhat smaller than those we photographed for background purposes.

The big avalanches were sent thundering down predetermined slopes. Cameras were mounted on ridge crests along the path of the snow at an average range of 50 yards. Telephoto lenses brought the action up close.

On the upper reaches of Mount Ajax, along the remote back trails where we filmed some of our avalanche and scenery sequences, the K-100 camera paid dividends. It was lighter than the other cameras, and on ski trips the spring-driven K-100 proved useful in really cold weather when battery driven cameras sometimes slowed or failed.

In general, only one of the four 16mm cameras was in action at any one time. We never used more than two in any single take. It is my feeling that when two cameras are operating simultaneously, the position of one almost necessarily has to be sacrificed, one camera invariably gets in the other's field of vision. Often, you can't pan to follow a piece of action completely because of the position of the second camera.

The Arriflex reflex cameras were generally used to film skiers in action by our cameramen on skis. The cameras were hand held, with no special attempt made to support or brace them. We weren't worried about minimum camera movement, just avoided sharp, hard knocks.

Originally, we planned to film the ski action sequences with the reflex cameras hand-held at eye level. The action was all downhill and in and out of trees. We reasoned that we would be able to follow the skiers most accurately by viewing their action directly through the lens. This did not, however, prove successful. Through-the-lens viewing enabled the skiing cameraman to see the skiers, but not such hazards as low-hanging branches which felled a cameraman on his first attempt at shooting this way. On the second pass, an unseen hump concealed by snow sent the cameraman pinwheeling. After these experiences the cameras were held chest high.

On another occasion, we tried mounting a camera on a tobaggan which paralleled the path of the skiers going down hill. The camera and operators were on the tobaggan, which was controlled by two men holding the rear and one holding the front. During the run downhill, the two men in the rear fell, the one in the front dove for cover, and the tobaggan, camera and crew took off while the cast watched in awe. There was nothing the camerman could do but ride it out to the bottom of the mountain. After this experience, we scratched toboggans off the list.

To shoot the ballet sequence, we took a tape recorder with an amplifier system out to the slopes and had our skiers follow through in time to the music. The characters in this sequence were played by skilled skiers. Several shots were made in slow motion, shooting at 32 to 48 frames per second, with the lens opened to f/5.6.

One of the most time-consuming sequences in "Fantasy on Skis," at least from the production standpoint, was the night search scene in which skiers carried torches as they moved over the slopes of Mount Ajax, searching for Suzy lost in the avalanche.

It was our opinion that shooting night shots actually at night simply would not achieve the best photographic results. The lighting would be too poor. So we filmed the entire search sequence during the "blue dusk" period of the day. This permitted us a mere twenty minutes shooting time daily.

Generally we began filming when our light meter indicated shooting at f/2.8 at normal speeds, and we continued filming until complete darkness set in. For these shots the Wratten 85 filters were removed from the camera lenses, resulting in a desirable bluish tint in the film.

At sunset each day, we assembled cast and crew on the slopes, ready to go, and we began shooting as soon as dusk set in. It took weeks to complete the sequence this way, but when we viewed the results at Walt Disney

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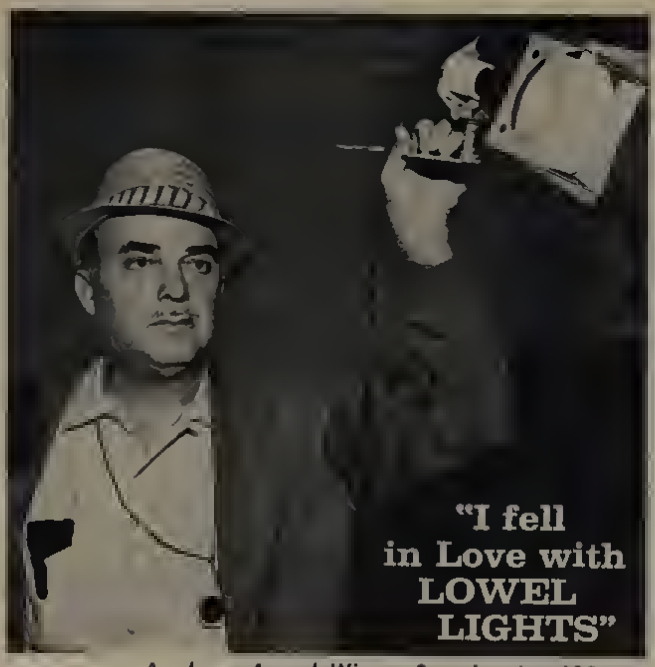

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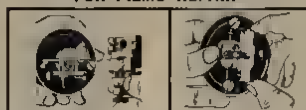

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Studios, all of the time we put into the job seemed well worth the effort.

All interior shots, as well as the exteriors, were filmed on location at Aspen We used two dressed sets: an interior of a ski patrol shack and Suzy's bedroom Other interiors were shot inside stores and shops in the Aspen area and were photographed just as we found them. Illumination for these interiors was provided by what the trade calls "Quads," portable lighting units consisting of two RFL and two RSP photolamps in a square-shaped mount.

Filming these interiors, of course, was more or less routine work, compared to our earlier shooting of the snow avalanche and skiing sequences. It was this shooting that really added considerably to our experience as a cinematographer—a new adventure in making "moving camera" shots. ■

BACKGROUND PLATES

Continued From Page 99

of a plate shot to script is to use stand-ins positioned exactly the same as the players will later be positioned in front of the projection screen A few feet of film should be shot with the stand-ins in position as a key, then the stand-ins should be removed and the plate photographed This will give the process cameraman an idea how the final shot should look, and the key footage will be particularly valuable should the plate cameraman be on an extended location trip and not around the studio to answer questions that may arise when the process photography is to be done

While the plate is being shot be certain that no one walks closer to the camera than the positions occupied by the stand-ins If someone were to walk between the stand-in position and the camera they would appear too large Since they will appear *behind* the players in the rear projected composite scene the required diminishing perspective will be upset To be safe, keep everyone in the scene ten feet or more behind the positions occupied by the stand-ins.

A special background slate should be used to record all pertinent data when shooting process plates. production number, scene number, camera height, camera angle, sun angle, focal length of lens used, etc This data will be helpful later in duplicating the setup

when the composite process scene is filmed

The combined rear-projected image and the live foreground scene must provide the proper perspective to appear correct. Their individual perspectives, particularly if an elaborate foreground set is used, must appear as one. This single perspective effect will be destroyed if people shown on the screen are larger than the players in the live foreground. Therefore, it is advisable, when in doubt, to move the camera back or to use a shorter focal length lens and record smaller images on the plate. The slightly smaller picture images that result will allow some leeway since, if necessary, the projected picture may be enlarged to provide the proper size screen image. Too large a film image, however, limits use of the plate to small size screens.

It is ideal, of course, to have all background images the proper size so that the fullest possible area of the plate's film frames can be utilized. This will provide the best photographic quality, least grain and sharpest picture with resulting top quality combination of plate and foreground players.

It is inadvisable to employ a lens on the camera shorter than 35mm unless only a part of the image is to be utilized. Certain type of backgrounds, if shot with an extreme wide-angle lens may present very difficult matching problems when rear projected. Slightly longer lenses on the order of 35mm, 40mm and 50mm are best.

Background views such as seen through a door or window are less critical to shoot for process plates since the view is a distant one and does not require an integrated relationship with the foreground. The camera angle must be correct, however, and present the proper vanishing point. A scene supposedly occurring in an office on the twentieth floor would require a plate comprising a view filmed from that apparent elevation, and presenting the proper viewpoint. While a considerable amount of "cheating" can be tolerated (such as shooting from the tenth floor of a building instead of the twentieth), the view presented should be one that would appear normal to a person on the live set looking out the window. The plate camera, must not, for example, be angled up or down; it must be shot dead level

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so that a "square on" view with true vertical lines is recorded.

The background plate cameraman should bear in mind that he is not expected to record beautiful compositions in themselves, but simply furnish the background to back up the combined rear projection-live set scene

Traveling Background Plates

Traveling background plates for rear process projection are used in combination with sound stage sets of supposedly moving vehicles, airplanes, trains or boats They may be filmed with either a single camera or with several cameras In order to provide the various plates necessary for shooting various combinations of group shots, closeups, over-the shoulder shots, etc., several angles should be filmed from the moving camera platform

It is advisable to use a single camera whenever possible to allow "cheating" the sunlight so that a time interval between runs may be chosen which will record each plate with the best light condition. Camera car speed may also be varied, if desired, for the various angles, if plates are shot individually.

More than one camera, each shooting at a different angle, should be employed when night shots are filmed at twilight, at the "magic moment" when the street and auto lights are turned on but there is still a bit of daylight and considerable tone in the sky This condition exists for only a few minutes and can be captured in a matching set of plates only if all camera angles are filmed simultaneously. The use of multiple cameras, of course, provides perfect matching since a car passing from behind will be picked up by the side camera.

Single camera plates will usually suffice, however, since the change in camera angle, when the process scene is photographed, is usually sufficient to cover any mismatch that may occur The audience is usually intent on watching the foreground action and the background plate will not distract unless something very jarring or glaringly different occurs. Normally, a considerable amount of "cheating" is permissible, indeed it is often required in order to record the best possible plate, one that will supply background action in the best light and at the correct rate of speed. Sometimes just one side of a street is filmed to serve for both side angles—by shooting left rear going one way and right rear going in the opposite direction Or, a single plate may be turned over in projection (if no tell-tale signs appear) to serve as views of both sides of a street

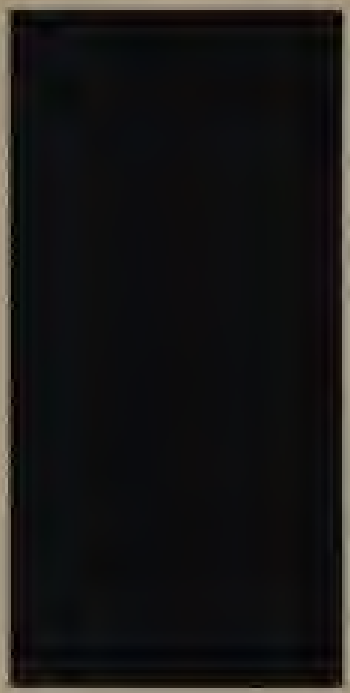
Of great importance in filming plates with a mobile camera is that the camera be at the correct height For autos the height should be at the *shoulders* (not the eye-level) of a person seated in the car that will later be used in the rear projected composita shot This will vary, for example, with low-slung sports cars and buses. It would not do to look out a sports car window and see the *roofs* of cars following (which would result if the plate camera were set too high). On the other hand, a low angle shot shooting up into trees and buildings would be equally bad because it is not feasible to angle a camera in a car to photograph seated people and see this perspective through the window.

The plate camera should be tilted *slightly* downward—just a trifle below horizontal The vanishing point of a straight-on shot would be just above dead center of the screen It is always better to have a little more pavement in the picture than sky A rear projected process set-up may require tilting down on a mock-up car. In such event, additional image in the lower corners of the frame would be desirable.

Traveling plates should be shot with 35mm or 40mm lenses on side and three quarter angle shots. A 35mm or sometimes a 50 mm (if only a small area of the plate will be utilized) is used on straight back shots. Modern cars, with their wrap around windshields, may require more image, however, and consequently the 35mm lens will prove the most useful for almost all angles

Speed vs. Angle

The camera angle employed to make a moving camera background shot affects the apparent speed of the projected image. Plates shot from straight side angles appear to move much faster than those filmed from either straight-forward or straight-back angles—although the speed of the vehicle from which the shots are made may be the same. It is often necessary, therefore, to cheat the camera vehicle speed (not the camera speed) so that all angles will appear at the same relative speed when rear projected. This effect is less apparent in



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open country than in a city street with its closely packed traffic and nearby buildings.

It is advisable to use normal 24 frames per second camera speed whenever possible so that pedestrians will appear to be moving normally. It is sometimes necessary in filming BG plates for wild chase shots to undercrank the camera since this is the only way to record ultra-fast vehicle speeds with safely.

The diagram below is useful for

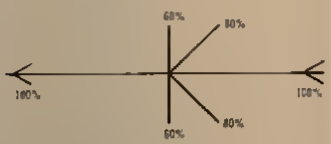

Diagram for estimating camera speeds when filming action at different angles

estimating camera car speeds for various camera angles. This is for city traffic. Various angle plates may be filmed in open country at the same camera car speed for all angles if nothing close to the camera appears in the plate.

For example, if the camera car

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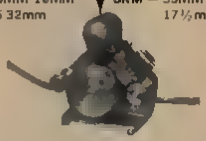

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travels at 50 miles per hour for the straight shots, it should travel at 40 m.p.h. for the three quarter angles and at 30 m p h for the side shots The camera should be set up at the same height and with the same *slight* downward tilt for all angles.

Horizon Plocement

An important compositional decision that arises in background plate photography is placement of the horizon in the frame When in doubt, or if the plate is for library use, the horizon should be placed in dead center since it may be moved up or down when projected This will afford the necessary leeway in fitting various composite filming situations.

Usually, however. the horizon is placed about two-fifths of the distance from the top of the frame, so it comprises two-fifths sky and three-fifths foreground It is advisable to have slightly more foreground in the plate scene. whether it be water, pavement or scenery

The best procedure, of course, is to photograph each plate three ways: one with the sky two-fifths from the top, one with the horizon centered and one with the sky occupying three-fifths of the frame. This will allow for any eventuality and give the Director added scope if he decides to shoot up or down on the process stage later. ■

THE ABOVE article is abridged from *American Cinematographer Manual*, published by the A S C Agency, Inc., Hollywood, Calif

LIGHT PILOT

Continued From Page 104

trol devices which correct the lens diaphragm continuously for change in scene brightness, the Light Pilot does not control the diaphragm of the lens in any way whatever, but operates independently of it to correct the light intensity after it passes through the lens enroute to the film

An advantage of the Light Pilot is that it operates independently of diaphragm settings on the lens, thereby permitting its use with more than one lens and without modifying the lens itself. At present. the Light Pilot is designed for use with long focus lenses, such as the 210mm shown in the accompanying illustrations, and it is intended for use on most any professional motion picture camera

The illustrations herewith show Light Pilot with lens attached, (Fig. 2); mounted on a Cineflex camera. (Fig. 1); and a schematic of the device, (Fig. 3). Not shown is the electronic control box which incorporates galvanometer, transistors, contactors, adjustment potentiometers, micro-relays, batteries which supply power to the tiny motor, etc., and by means of which the sensitivity of the Light Pilot is adjusted to suit the exposure norm and the speed of the film used in the camera

With a camera equipped with the Light Pilot, the operator may shoot directly into the sun without having to take any of the usual precautions. Coutant explains. The device makes it possible to photograph such extremes in subject matter as an aircraft in flight passing in front of the sun in a clear sky, with the exposure of the principal subject matter—the plane—held constant throughout, thanks to the Light Pilot's light sensoring capability The sun itself may be photographed directly. then the camera panned earthward to record nearby objects properly exposed—all without any manual adjustment of the lens

The schematic drawing, Fig 3, graphically illustrates this function (1) is the camera lens through which the image light beam is directed to the film (2) Prior to this moment, however the beam of light passes through a front-surface mirror (3) set at an angle of 45 degrees, and its 20 per cent aluminized coating reflects the incoming image upon the sensitive cell (4) Thereafter, a collecting lens (5) directs the image light beam to the electronic cell (6), which generates electrical power to turn the tiny motor (7) This motor, through a reduction gear (8) rotates the light-controlling disc (9) until the strength of the light falling upon the photocell is completely diminished and terminates the operation of the motor. The proper segment of the graduated disc is now at rest on the axis of the light beam of the incoming picture image

The stronger the light that enters the lens, the greater the reaction of the electronic sensor, which causes the motor to turn the graduated disc until the proper light-reducing sector its interposed on the axis of the light beam.

One of the strong features of the Light Pilot is that it permits shooting in a wide range of light conditions without having to resort to the use of light-reduction filters or changing the shutter opening of the camera.

The manufacturer. Kinotechnique (Neuilly-Sur-Sein, France) sees potentially wide application of this automatic light monitoring device in news reel photography, in the filming of sports events, in scientific cinematography, and in photo-instrumentation where shooting under constantly varying light conditions is more general than is encountered in the more conventional fields of theatrical and TV film photography.

Coutant, a native of Paris, is President of the Association Francaise des Ingenieurs et Technicians du Cinema; is a member of the Commission Superieure Technique du Cinema Francaise; and is President of Kinotechnique Along with Mr A Arnold of Arri in Germany, he recently received the Eurotecnia Prize of 1960 and the Gold Medal of the Societe d'Encouragement a l'Industrie Nationale for his outstanding achievements ■

"MOON PILOT"

Continued From Page 90

necessarily be lighted in high-key — but where a good deal of the humor depends upon facial expressions and reaction closeups, it is essential that faces be clearly seen, no matter what the indicated mood If you go too heavy on the shadows a terrific laugh might be lost."

The opening sequence which unfolds inside the satellite control room illustrates how Snyder solved this seeming paradox The situation definitely called for mood-lighting to accentuate the atmosphere of suspense that would normally accompany an important first launching. This mood was achieved by lighting the background walls in low-key and breaking them up with shadow patterns, so that just the light from the instruments are prominent. The faces are lighted by a key just to the right of center, so that, while there is a shadow down the side, all of the features are clearly visible for expression and reactions

A similar problem arose during

filming of a hilarious sequence in which a group of extra-weird female beatniks are brought in to a police line up for identification. In an actual line up situation, the spectators would sit in absolute darkness so that the suspects could not see their faces. But here, again, it was necessary that the facial reactions of the spectators be seen. In order to solve the problem, Snyder let the background go black and lighted the spectators with sharp cross-light relieved with just enough fill light to allow their expression to register.

Filming on the picture began at Vandenberg Air Force Base, where scenes were made showing the reluctant hero being raised on an elevator to board the capsule of a gigantic missile standing ready on the launching pad. Shooting of the sequence was made precarious by the proximity to huge amounts of liquid hydrogen and other explosive fuels near the gantry where the missile was actually being readied for takeoff. Because of the high danger of explosion, the camera crew could not use arc lights as boosters, but had to confine its operation to the use of incandescent units.

After this sequence was completed, the company moved on to San Francisco for six days of location shooting in various sections of the city. The background scenes needed for process were shot first, before the actors arrived—thus allowing plenty of time to ship the film to the studio for critical viewing and checking of quality. Shooting these background scenes on the hills and bumpy streets of San Francisco was a technical challenge. The tires on the camera car had to be almost completely deflated to insure the smoothest of travel—and special care had to be taken with the straight forward running shots, which were made from a somewhat shaky platform extending from front of the car.

The night chase through Chinatown and Fisherman's Wharf demanded intricate set-ups involving many lights and generators brought from Hollywood.

The San Francisco location included dialogue sequences shot at Fisherman's Wharf, Coit Tower, in a park, on a bus, and several running sequences in moving cars. Master scenes were shot in the actual locales, the medium and close shots for intercutting were filmed later in the studio,

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utilizing a special sodium vapor traveling matte process adopted by the Disney Studios a few years ago to replace conventional rear-projection process filming.

In applying this technique, a huge, orange-colored screen evenly illuminated with light from special sodium vapor lamps is set up on the sound stage as a background. The action played in front of it is lighted by arcs, with great care being taken not to mix the two types of light. Filming is done with a converted three-strip Technicolor camera through which two strips of film are run simultaneously —one color and the other black-and-white, threaded in the camera back to-back.

After development, the black and-white strip becomes the traveling matte that facilitates printing-in of whatever background is required.

The Special Effects Department takes over after photography is completed and makes a composite dupe negative of the two scenes printed together by means of an optical printer. The sodium vapor process has several important technical advantages and a few relatively minor disadvantages.

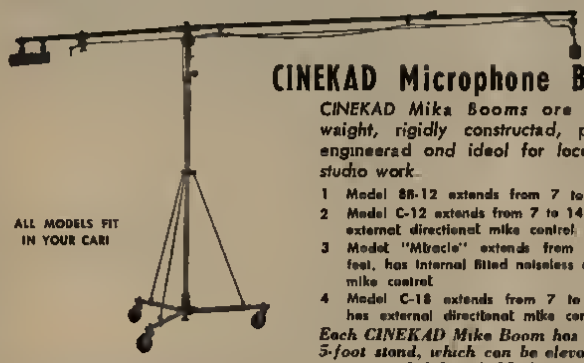
On the credit side—it completely eliminates costly, time-consuming rear-projection process set ups. There is no process projector involved nor any need for rewinding a background process scene every time a new take is made. Also, if an actor fluffs a line, he can repeat it correctly and go right on. In the case of running shots in a car, a small projector and screen is set up off-camera merely to cue the actor so that his action on turns will coincide with what happens in the background scene.

The sodium vapor method Snyder explains, affords the lab complete technical control of the final result. The background scenes can be precisely balanced in relation to the foreground action and this balance can be varied for particular effects. Detail in backgrounds made this way is much sharper and colors are more natural than in rear-projection process. If the detail in the background appears *too* sharp in relation to the foreground action, as sometimes happens, it can be diffused in printing. Also, in the case of closeups of women, for example, diffusion which would normally be produced at the time of shooting by placing a diffusion disc in front of the lens, is actually added by Special Effects later during optical printing. The cinematographer merely indicates in advance how much diffusion he wishes in each scene.

The sodium vapor method is also free of the fringe effect sometimes evident when rear-projection process or other traveling matte systems are used. It does, however, have a few disadvantages. It is necessary to go to a dupe-negative stage in making the optical Composite. Secondly, since the light must pass through a filter-prism in the camera, plus two strips of film sandwiched together a great deal more light is needed than in straight filming. Whereas Snyder works at a level of 400 foot-candles on the sound stage to get an exposure of f/4 for Technicolor in normal shooting, he has to go to 1200 foot-candles in shooting a sodium vapor scene. The intensified heat and glare that results is sometimes hard on the cast.

Despite the few drawbacks, the sodium process, developed in England and adopted by Disney Studios, produces a technically sharp, fully color-saturated result on the screen, with none of the bothersome fringe effects sometimes obvious in rear-projection shots or those made using other traveling matte processes.

After the location shooting on "Moon Pilot" was completed in San Francisco, the company moved back into the studio to continue filming on some interesting interior sets. An exact replica of the Vandenberg blockhouse was built on the stage, including consoles packed with the sort of push buttons and flashing lights used to handle and record the progress of a



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Another unusual set was the "flying boxcar" used in the capsule recovery sequence. This was an actual Air Force plane which had become irreparably damaged when the landing gear collapsed. The ship had been retired to an Air Force "boneyard" where Disney technicians found it and received permission to cut it into segments for use as a set. One side of the fuselage was cut out to permit full camera angles, and the cockpit compartment was disassembled for use as a separate "set." Snyder lighted these units for a documentary quality so that they tied in perfectly with the spectacular Air Force footage of an actual mid-air capsule recovery.

Perhaps the most interesting challenge was photographing the inside of the capsule itself. Nobody outside official circles knew very much about how the interior actually looked, but the Art Department got as close as possible to the real thing based on information and photographs provided by the Air Force. Some of the authentic instruments were also used as set dressing. Figuring out a logical light source for the tiny compartment was somewhat without precedent, but Snyder developed his own conception based on how he personally felt it should look—even including a light change from normal to cold blue light on the astronaut's face as the capsule left its earth orbit. So far, no one has complained about the authenticity—not even the Air Force. ■

CINEMATOGRAPHY IN THE ATOMIC AGE

Continued From Page 95

to guard their safety, didn't particularly care for the idea—but when the photographers continued to insist it was decided to provide a window twelve inches in diameter, made of clear plastic one-inch thick.

At all times when the photographer leaned over the window during shooting, a health physicist stood directly over him with a Geiger counter, measuring the radiation as it came *through* his head. Radiation fairly streamed from the reactor, reaching at one time a level of 300 milli-Roentgens. The cameramen, with their eyes directly over the window, were allowed only 20 seconds of the exposure at a time. The rest of the time they held the

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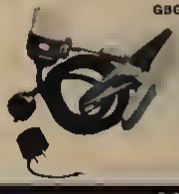

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camera directly over the port and shot blind

Although they were frequently exposed to the deadly rays, they were never allowed to receive more radiation than could be safely tolerated. The total was well under the maximum that could be taken over a certain period of time. A health examination made after shooting was completed revealed that both cameramen were in fine condition. The camera, which had remained in its plastic bag for the entire six weeks, was also examined and found to be completely free of contamination.

During the six-weeks shooting period, fifty-eight 100-foot rolls of film were exposed. The photography detailed every phase of the step-by-step repair operation. Of the total footage exposed, only about 300 feet, however, was considered technically acceptable inasmuch as the film was designed to inform and guide prospective users of nuclear energy for the production of electricity. It demonstrates most graphically that repairs [illegible] ponents are entirely feasible, and shows exactly how some are accomplished.

In this field of motion picture production, should any of the photographic equipment become contaminated, the contamination is usually light and easily washed away with acetone or plain water. It was found that the casters on lamp stands tended to pick up contamination from the floor. To cope with this, the surfaces of the casters were wound with tape, which was readily removable and destroyed after use.

Whenever equipment receives more radiation than can be washed off in the normal manner, it is usually disposed off.

At one time a Bolex camera was almost lost this way. The camera had been left in a contaminated area over a weekend because shooting was to be resumed the following Monday. Meanwhile, the camera was accidentally dumped into a contamination barrel where it came into contact with some very "hot" refuse. The frantic photographer came running to retrieve the now highly radioactive camera. Two hours of very diligent scrubbing finally removed the last traces of radiation from the Bolex, and while considerably faded, it was saved to film another day.

The company's film unit has lost only a few pieces of relatively unimportant equipment (light cords, tripod triangles, etc.) this way, because the radiation could not be washed off. The Health Physics Department is very meticulous about checking each piece of equipment to make sure it is free of radiation when it comes out of the area.

The question of what effect, if any, the prevalent radiation had on motion picture film came up at this point in our discussion. A-I's film unit earlier had conducted a number of tests and experiments on this subject and found that sensitized photographic film will tolerate rather high exposure to radiation, providing, of course, it is given reasonable protection. Surprisingly, the cans in which film is normally packed, provide excellent protection. And unless the cans accidentally come in contact with a strong radioactive source, they will shield their contents from radiation. When the film is in the camera the body of the camera and the elements of the lenses themselves adequately protect the film within. During the five years that A-I's film unit has been functioning not a single frame of film has been fogged through radiation.

Hoping to reduce the risks involved in photographing directly into a reactor core, a new type of motion picture camera has been designed that will eliminate the necessity of shooting through reactor windows, assure more satisfactory photography, and afford greater protection against radiation for the operator. Three-and-an-eighth inches in diameter and twelve inches in length, it will fit snugly into a 3½-inch porthole in the shield of the reactor. It will carry its own built-in light source—a strobe unit that will produce separate synchronized light flashes for each frame of film—and afford a range of shooting speeds from 8 to 32 fps. Also to be included are built-in optical relays, a lens shielding device, and a cooling system. Although the camera is designed to accommodate 80-foot rolls of 16mm film, Teflon tubes are to be provided through which the film will run directly out of the camera after exposure and to a 400-foot magazine six feet away.

So far, the camera is still on the drawing board. It can be custom-built for around $6,000. With it, projects such as the one described above, can be photographed in one-third the time and with greater safety for the photographer.

Although much of A-I's film unit's work is directed toward shooting progress reports for the Atomic Energy Commission, it also does certain instrumentation photography. In this work, a Fastax ultra high-speed camera capable of exposing film up to 8,000

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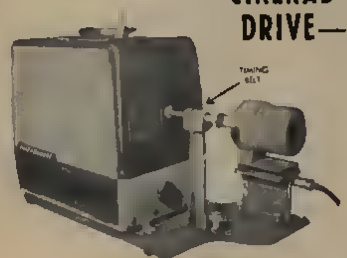

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frames per second is used. Occasionally time lapse photography is needed. For one such project recently, a Maurer camera was rented, which had been specially pre-set to expose one frame every 1½ seconds

One of the most interesting and challenging assignments given the unit involved the photography of an image directly from the face of an electron microscope The material under examination was a sample of graphite and was magnified 15,000 to 25,000 times so that the molecular motion within the particles could be clearly observed

When this project was first suggested, the first thought was that it would be impossible to photograph, since the electron microscope screen gives off only 3/10 of a foot-Lambert of light Mostly out of curiosity, the unit made a test shooting at 16 fps using a Bolex-mounted f/1.4 lens and Tri-X Pan film After normal processing an image could just barely be detected, but this was enough to fire the imagination of the photographers.

In filming the actual microscope examination later a 1-inch f/0.95 lens was used, and arrangements were made with the Telefilm, Inc, laboratories in Hollywood to provide special processing The film was developed as a negative to preserve maximum speed, with the processing machine operating at slightly reduced speed. Each roll was regarded as a separate problem and the last 10 feet was developed as a test A Cinex strip was then made to determine the best processing speed for that particular roll

In all, 20,000 feet of film was exposed on this project, which was subsequently edited to 800 feet of subject matter, considered so technical in content that it is estimated there are only 15,000 scientific personnel in the United States sufficiently knowledgeable to understand it. During shooting, the cameraman set up the shot and stood by to reload; but the camera was actually controlled by the scientist making the experiment, because only he knew exactly what part of the "action" should be filmed During the editing process, he worked closely with editor and explained what was happening in each frame

At present, Atomics International's in-plant film unit is in the process of completing a film made in conjunction with the Martin Company, which

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explains in detail the activities of SNAP (Systems for Nuclear Auxiliary Power). Ordered by the Atomic Energy Commission and slanted to an audience of educated laymen the film begins with an analysis of the uses of electricity to man and the necessity for man to explore outer space.

In space, only two sources for the production of electricity are thus far feasible: the solar battery and nuclear energy. The film analyzes the various models of reactors under experiment—some of which will be geared to provide electrical power for space vehicles, once they have been launched by rockets, answering the need for light weight power sources that will last a long time. Other models will be put to earthbound environmental uses in remote areas such as the Arctic where no other source of electrical power is practical.

The finished film will run 28½ minutes, making it convenient for television release, and it will rely largely on animation. Because of the theoretical nature of much of the subject matter, as well as the impossibility of illustrating technical points clearly in any other way, a great deal of animation is used in Atomics International films. This phase of production is produced outside of the organization, as is also all sync-sound shooting and finished sound recording.

All this prodigious activity, which comprises an average of 10,000 feet of film per month, is carried on by a crew of six highly skilled motion picture technicians. There are two writer directors, one of whom heads the unit as coordinator. There are two cameramen, a film editor and a film librarian. With a minimum of equipment and a maximum of skill and ingenuity, this tightly-knit film making group undertakes some of the most interesting and dangerous assignments ever given to an industrial motion picture unit. ■

LENS AND CAMERA TEST

Continued From Page 103

a distance) should be affixed to the chart with bits of masking tape, as shown in the illustrations. I generally include in such data the focal length of the lens, last three serial numbers, and the extreme right and left numbers that are visible in the viewfinder—which will be the same for each series of similar focal length lenses.

Next, a piece of black masking tape is affixed at the top and bottom of the chart to indicate the maximum area taken in vertically by the camera viewfinder.

The single source of illumination is then adjusted to permit working at a fixed f/ stop with each lens to be tested and for the type of film used. I have found that f/2.8 produces exposures of good resolution and at the same time permits the depth of field to fall off at both extremities of the chart when photographed at an angle, making the plane of maximum sharpness readily apparent. Best definition will be obtained with films of moderate speed, such as DuPont 901A-Superior 2 or Eastman Plus X. Negative film having a black backing should not be used for these tests, as the backing will come off in the processing—a messy proposition when processing the test film by hand.

To avoid the incidence of any "slack" in the lens diaphragm, it is advisable always to *stop the lens down* from the largest iris opening to the desired f/ stop—a good procedure to follow, also, where distance is set by tape measurement instead of through the lens focusing.

About three feet of film is enough to expose for each test—a length that is adequate for making a loop for projection, and which screens for a period of five seconds at 24 fps. Test lengths that are too short may cause projection difficulties, while those too long prove unwieldly when processing by hand, as recommended here. In all cases, the strips should be the same length for all lenses so tested. And it is timely to remind the reader at this point that a new data card should be mounted on the chart prior to shooting each lens test.

Where tests on a number of lenses are shot at one time one following the other, do not blank out any frames between each test, the quick cut from one test to the other affords a good comparison of the lens' performance. About a foot of film can be blanked off (by momentarily covering the lens as the camera is started) between *each series* of different focal length lenses, where the test operation involves a great number of lenses. The blanked area will provide a reference point for splicing the loops as well as an orientation projection start-mark.

Where a photographic darkroom is

Continued On Page 128

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LENS AND CAMERA ACCURACY TEST

Continued From Page 124

unavailable for processing the test strips, it may be possible to utilize the room normally used for loading film in the camera, or some other light-tight closet, room, or cubicle. Three tanks, trays or polyestrene buckets will be required for the solutions, plus a source of fresh water. Unwind the exposed negative and place it in a small carton, and "dunk" it in the developer solution for the required period, properly agitating it meanwhile The short film lengths should not be unwound directly into the developer as the first portion submerged will receive greater development than the last, and the resultant density will be uneven.

Most any of the standard film developing solutions can be used, providing the processing time is reduced below normal to produce a low gamma negative If a heavy negative is produced, it will tend to block up and be difficult to read during projection, I generally use Dektol developer diluted 1 part to 3 parts of water, and process the film for 1 minute at 68° F, using constant agitation This is followed by a few seconds of rinse in running water, then the film is immersed in hypo for a period of 3 minutes The film should remain in the hypo until completely cleared of the white opacity This may require a hypo bath of up to 5 minutes, but a longer period of time will not harm the film Afterward, the film should be washed in running water for 5 minutes, then hung to dry. At this time, both sides of the film should be wiped with a soft, moist chamois, photo sponge, or soft clean toweling.

All immersions of the film in the various solutions should be done carefully, and gently and continuously agitated by slowly raising and simultaneously turning the film mass. This, of course, is a rather crude processing method, but one that yields a satisfactory film for test purposes.

After the processed film is completely dry, separate each test section and make a loop of it by splicing the ends together. A method for suspending the loop for projection is shown in an accompanying photo.

Projection of the various strips permits making comparisons between various lenses and detecting differences in sharpness, plane of focus, viewfinder alignment, and accuracy of the footage scale calibrations Deficiencies in camera performance may also be observed, such as "breathing" of image, image steadiness, shutter flicker, etc

It goes without saying, of course, that the test method prescribed here cannot reveal all the ills that cameras and optics are heir to But it will provide a direct and fast determination of general camera performance and a graphic comparison of one lens with another ■

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